







**New Mexico Commission of Public Records  
Administrative Law Division**

1205 Camino Carlos Rey  
Santa Fe, NM 87507  
505-476-7907

**Affidavit of Publication in the *New Mexico Register***

I, Art Bransford, certify that the agency noted below has published legal notices or rules in the New Mexico Register, and that payment has been assessed by invoice for said legal notice or publication, which appeared on the date and in the volume and issue number noted below.

**Date of Publication:** 6/28/2013

**Volume:** XXIV **Issue #:** 12

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**Amount:** \$88.00

**Agency:**

Environment Department

Contact: Rita Bates

1190 St Francis Dr

Santa Fe, NM 87505-

**Description:**

Other

Other Material

Notice of State Implementation Plan

Other

Other Material

Notice of State Implementation Plan

State of New Mexico, County of Santa Fe

Signed and affirmed before me on Friday, June 28, 2013

by Art Bransford

**Notary Public:**

Louise Wood

[My commission expires: 3/5/17]

**Affiant:**

Publisher, *New Mexico Register*

**Date:** 6/28/2013

~Copies of the published material documented in this affidavit are enclosed~

Form SRC-2002-04 Revised July 2007

(seal)

## Other Material Related to Administrative Law

### NEW MEXICO ENVIRONMENTAL IMPROVEMENT BOARD

#### NEW MEXICO ENVIRONMENTAL IMPROVEMENT BOARD NOTICE OF STATE IMPLEMENTATION PLAN HEARING

The New Mexico Environmental Improvement Board ("Board") will hold a public hearing on September 5, 2013, beginning at 9:00 am in Room 7103 at San Juan College, 4601 College Boulevard, continuing on September 6, if necessary. The New Mexico Environment Department ("NMED") is proposing to adopt revisions to the New Mexico State Implementation Plan for Regional Haze. The proposed plan establishes requirements for New Mexico to meet the requirements of 40 CFR Section 51.309, including a revised determination of Best Available Retrofit Technology for the San Juan Generating Station, located 15 miles west of Farmington. The proposed plan involves the voluntary retirement of two of the four units at this facility, and the installation of selective non-catalytic reduction on the other two units.

The proponent of this regulatory adoption and revision is the New Mexico Environment Department ("NMED").

The purpose of the public hearing is to consider and take possible action on a petition from NMED regarding revisions to New Mexico's State Implementation Plan under the federal regional haze rule, 40 CFR Section 51.309. The regional haze rule requires states to submit State Implementation Plans to address visibility impairment caused by regional haze in 156 federally-protected parks and wilderness areas, known as Class I areas, including nine such areas in New Mexico.

The proposed revised plan may be reviewed during regular business hours at the NMED Air Quality Bureau office, 525 Camino de los Marquez, Suite 1, Santa Fe, New Mexico. The full text of NMED's proposed revised State Implementation Plan are available on NMED's web site at [www.nmenv.state.nm.us](http://www.nmenv.state.nm.us), or by contacting Rita Bates at (505) 476-4304 or by email at [rita.bates@state.nm.us](mailto:rita.bates@state.nm.us).

The hearing will be conducted in accordance with 20.1.1 NMAC (Rulemaking Procedures – Environmental Improvement Board), the Environmental Improvement Act, Section 74-1-9 NMSA 1978, the Air Quality Control Act, Section 74-2-6 NMSA 1978, and other

applicable procedures.

All interested persons will be given reasonable opportunity at the hearing to submit relevant evidence, data, views and arguments, orally or in writing, to introduce exhibits, and to examine witnesses. Persons wishing to present technical testimony must file with the Board a written notice of intent to do so. The notice of intent shall:

- (1) identify the person for whom the witness(es) will testify;
- (2) identify each technical witness that the person intends to present and state the qualifications of the witness, including a description of their education and work background;
- (3) include a copy of the direct testimony in narrative form of each technical witness;
- (4) attach each exhibit anticipated to be offered by that person at the hearing; and
- (5) attach the text of any recommended modifications to the proposed regulatory change.

Notices of intent for the hearing must be received in the Office of the Board not later than 5:00 pm on August 16, and should reference the docket number, EIB 13-02 (R) and the date of the hearing. Notices of intent to present technical testimony should be submitted to:

Pam Castañeda, Board Administrator  
Office of the Environmental Improvement Board  
Harold Runnels Building  
1190 St. Francis Dr., Room N2150  
Santa Fe, NM 87505  
Phone: (505) 827-2425, Fax (505) 827-2836

Any member of the general public may testify at the hearing. No prior notification is required to present non-technical testimony at the hearing. Any such member may also offer exhibits in connection with his testimony, so long as the exhibit is not unduly repetitious of the testimony.

A member of the general public who wishes to submit a written statement for the record, in lieu of providing oral testimony at the hearing, shall file the written statement prior to the hearing, or submit it at the hearing.

Persons having a disability and needing help in being a part of this hearing process should contact J.C. Borrego by August 16, 2013 at the NMED, Human Resources Bureau, P.O. Box 5469, 1190 St. Francis Drive, Santa Fe, New Mexico, 87502-5469, telephone 505-827-0424. TDY users please access his number via the New Mexico Relay Network at 1-800-659-8331.

The Board may make a decision on the proposed revised state implementation plan at the conclusion of the hearing, or the Board may convene a meeting at a later date to consider action on the proposal.

### NEW MEXICO ENVIRONMENTAL IMPROVEMENT BOARD

#### NEW MEXICO ENVIRONMENTAL IMPROVEMENT BOARD NOTICE OF STATE IMPLEMENTATION PLAN HEARING

The New Mexico Environmental Improvement Board ("Board") will hold a public hearing on September 5 or 6, 2013 in Farmington, New Mexico in Room 7103 at San Juan College, 4601 College Blvd. The hearing will commence immediately following the hearing in EIB No. 13-02 (R), scheduled for September 5 - 6 (as necessary), 2013 at the same location. The purpose of the public hearing is to consider and take possible action on a petition from the New Mexico Environment Department ("NMED") regarding revisions to New Mexico's State Implementation Plan (SIP). NMED is proposing that the Board adopt revisions to the SIP to satisfy the "good neighbor" requirements of Clean Air Act ("CAA") Section 110(a)(2)(D)(i)(II) with respect to visibility for the 8-hour ozone and particulate matter under 2.5 microns in diameter ("PM 2.5") National Ambient Air Quality Standards promulgated in July 1997.

The "Good Neighbor" provision of CAA Section 110(a)(2)(D)(i)(II) requires that each SIP submitted to EPA must address emissions from within the state that affect other states through interstate transport. The U.S. Environmental Protection Agency ("EPA") has determined that New Mexico has satisfied the Good Neighbor provisions with respect to visibility for all emission sources except the San Juan Generating Station ("SJGS").

The NMED's proposed Regional Haze SIP, which will be considered in the hearing in EIB No. 13-02 (R), contains a Best Available Retrofit Technology ("BART") determination for nitrogen oxides ("NOx") for the SJGS. The BART determination calls for a NOx emission rate of 0.23 pounds per million British thermal units (lb/mmBtu) for SJGS Units 1 and 4, and a shutdown by the end of 2017 of SJGS Units 2 and 3. For sulfur dioxide, the Regional Haze SIP calls for a limit of 0.10 lb/mmBtu at SJGS Units 1 and 4. These nitrogen oxide and

sulfur dioxide emission limits exceed the expectations that neighboring states relied upon when developing their own visibility SIPs. Therefore, NMED proposes that the Board adopt these limits as also satisfying the independent requirements of CAA Section 110(a)(2)(D)(i)(II).

The proponent of this regulatory adoption and revision is the New Mexico Environment Department ("NMED").

The proposed revised plan may be reviewed during regular business hours at the NMED Air Quality Bureau office, 525 Camino de los Marquez, Suite 1, Santa Fe, New Mexico. The full text of NMED's proposed State Implementation Plan is available on NMED's web site at [www.nmenv.state.nm.us](http://www.nmenv.state.nm.us), or by contacting Rita Bates at (505) 476-4304 or by email at [rita.bates@state.nm.us](mailto:rita.bates@state.nm.us).

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- (4) list and attach each exhibit anticipated to be offered by that person at the hearing; and
- (5) attach the text of any recommended modifications to the proposed regulatory change.

Notices of intent for the hearing must be received in the Office of the Board not later than 5:00 pm on August 16, 2013, and should reference the docket number, EIB 13-03 (R), and the date of the hearing. Notices of intent to present technical testimony should be submitted to:

Don Castañeda, Board Administrator  
Office of the Environmental Improvement Board  
Harold Runnels Building  
1190 St. Francis Dr., Room N2150

Santa Fe, NM 87505

Phone: (505) 827-2425, Fax (505) 827-2836

Any member of the general public may testify at the hearing. No prior notification is required to present non-technical testimony at the hearing. Any such member may also offer exhibits in connection with his testimony, so long as the exhibit is not unduly repetitious of the testimony.

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Persons having a disability and needing help in being a part of this hearing process should contact J.C. Borrego by August 16, 2013 at the NMED, Human Resources Bureau, P.O. Box 5469, 1190 St. Francis Drive, Santa Fe, New Mexico, 87502-5469, telephone (505) 827-0424. TDY users please access his number via the New Mexico Relay Network at 1-800-659-8331.

The Board may make a decision on the proposed revised state implementation plan at the conclusion of the hearing, or the Board may convene a meeting at a later date to consider action on the proposal.

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### End of Other Related Material Section

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# AFFIDAVIT OF PUBLICATION

STATE OF NEW MEXICO  
County of Bernalillo

SS

Linda MacEachen, being duly sworn, declares and says that she is Classified Advertising Manager of The Albuquerque Journal, and that this newspaper is duly qualified to publish legal notices or advertisements within the meaning of Section 3, Chapter 167, Session Laws of 1937, and that payment therefore has been made of assessed as court cost; that the notice, copy of which is hereto attached, was published in said paper in the regular daily edition, for 1 times, the first publication being on the 28<sup>th</sup> day of June, 2013, and the subsequent consecutive publications on \_\_\_\_\_, 20\_\_\_\_.

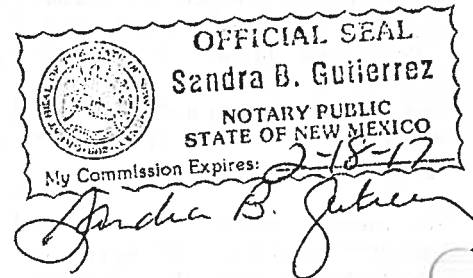
Linda MacEachen

Sworn and subscribed before me, a Notary Public, in and for the County of Bernalillo and State of New Mexico this 2<sup>nd</sup> day of July of 2013.

PRICE \$481.31

Statement to come at end of month.

ACCOUNT NUMBER 1008533



Gov't Legals

Gov't Legals

Gov't Legals



NEW MEXICO ENVIRONMENTAL IMPROVEMENT BOARD  
NOTICE OF STATE IMPLEMENTATION PLAN HEARING

The New Mexico Environmental Improvement Board ("Board") will hold a public hearing on September 5, 2013, beginning at 9:00 am in Room 7103 at San Juan College, 4601 College Blvd., continuing on September 6, if necessary. The New Mexico Environment Department ("NMED") is proposing to adopt revisions to the New Mexico State Implementation Plan for Regional Haze. The proposed plan establishes requirements for New Mexico to meet the requirements of 40 CFR Section 51.309, including a revised determination of Best Available Retrofit Technology for the San Juan Generating Station, located 15 miles west of Farmington. The proposed plan involves the voluntary retirement of two of the four units at this facility, and the installation of selective non-catalytic reduction on the other two units.

The proponent of this regulatory adoption and revision is the New Mexico Environment Department ("NMED").

The purpose of the public hearing is to consider and take possible action on a petition from NMED regarding revisions to New Mexico's State Implementation Plan under the federal regional haze rule, 40 CFR Section 51.309. The regional haze rule requires states to submit State Implementation Plans to address visibility impairment caused by regional haze in 156 federally-protected parks and wilderness areas, known as Class I areas, including nine such areas in New Mexico.

The proposed revised plan may be reviewed during regular business hours at the NMED Air Quality Bureau office, 525 Camino de los Marquez, Suite 1, Santa Fe, New Mexico. The full text of NMED's proposed revised State Implementation Plan are available on NMED's web site at [www.nmenv.state.nm.us](http://www.nmenv.state.nm.us), or by contacting Rita Bates at (505) 476-4304 or by email at [rita.bates@state.nm.us](mailto:rita.bates@state.nm.us).

The hearing will be conducted in accordance with 20.1.1 NMAC (Rulemaking Procedures - Environmental Improvement Board), the Environmental Improvement Act, Section 74-1-9 NMSA 1978, the Air Quality Control Act, Section 74-2-6 NMSA 1978, and other applicable procedures.

Interested persons will be given reasonable opportunity at the hearing to submit relevant evidence, data, views and arguments, orally or in writing, to introduce exhibits, and to examine witnesses. Persons wishing to present technical testimony must file with the Board a written notice of intent to do so. The notice of intent shall:

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- (3) include a copy of the direct testimony in narrative form of each technical witness;
- (4) attach each exhibit anticipated to be offered by that person at the hearing; and
- (5) attach the text of any recommended modifications to the proposed regulatory change.

Notices of intent for the hearing must be received in the Office of the Board not later than 5:00 pm on August 16, and should reference the docket number, EIB 13-02 (R) and the date of the hearing. Notices of intent to present technical testimony should be submitted to:

Pam Castañeda, Board Administrator  
Office of the Environmental Improvement Board  
Harold Runnels Building  
1190 St. Francis Dr., Room N2 150  
Santa Fe, NM 87505  
Phone: (505) 827-2425, Fax (505) 827-2636

Any member of the general public may testify at the hearing. No prior notification is required to present non-technical testimony at the hearing. Any such member may also offer exhibits in connection with his testimony, so long as the exhibit is not unduly repetitious of the testimony.

A member of the general public who wishes to submit a written statement for the record, in lieu of providing oral testimony at the hearing, shall file the written statement prior to the hearing, or submit it at the hearing.

Persons having a disability and needing help in being a part of this hearing process should contact J.C. Borrego by August 16, 2013 at the NMED, Human Resources Bureau, P.O. Box 5469, 1190 St. Francis Drive, Santa Fe, New Mexico, 87505-5469, telephone 505 827-0424. TDY users please access his number via the New Mexico Relay Network at 1-800-659-8331.

The Board may make a decision on the implementation plan at the conclusion of the hearing, or the Board may convene a meeting to take further action on the proposal.

DIRECCION DE MEJORAS MEDIOAMBIENTALES DE NUEVO MÉXICO  
AVISO DE AUDIENCIA DE IMPLEMENTACION DE PLAN DEL ESTADO

La Dirección de Mejoras Medio-Ambientales de Nuevo México ("Dirección") tendrá una audiencia pública el 5 de Septiembre 2013 a las 9:00 a.m. en la sala 7103 en San Juan College, 4601 College Blvd., seguida el 6 de Septiembre 2013 (según sea necesario). El Departamento del Medio Ambiente de Nuevo México ("NMED", por sus siglas en inglés) propone adoptar revisiones al Plan de Implementación del Estado de Nuevo México para la neblina regional. El plan propuesto establece requisitos para que Nuevo México cumpla los de 40 CFR Sección 51.309, incluso una determinación revisada de la mejor tecnología de modernización para la estación generadora San Juan, situada 15 millas al occidente de Farmington. El plan propuesto involucra el retiro voluntario de dos de cuatro unidades en estas instalaciones y la instalación de una reducción no catalítica selectiva en otras dos unidades.

El Departamento del Medio Ambiente de Nuevo México ("NMED") es el que propone esta adopción y revisión regulatorias.

El propósito de la audiencia pública es considerar y tomar una posible acción sobre una petición del NMED con relación a las revisiones del Plan de Implementación del Estado de Nuevo México bajo la norma federal sobre neblina regional, 40 CFR Sección 51.309. La norma de neblina regional requiere que los estados presenten Planes de Implementación Estatal para tratar la falta de visibilidad causada por la neblina regional en 156 parques y áreas silvestres protegidos federalmente, las que se conocen como áreas de Clase I, e incluyen nueve en Nuevo México.

El propuesto plan modificado pueda ser revisado durante las horas regulares de oficina, en NMED Air Quality Bureau, 525 Camino de los Marquez, Suite 1, Santa Fe, Nuevo México. El texto completo y revisado del propuesto Plan de Implementación está disponible en el sitio [www.nmenv.state.nm.us](http://www.nmenv.state.nm.us), o comunicándose con Rita Bates en el (505) 476-4304 o por correo electrónico: [rita.bates@state.nm.us](mailto:rita.bates@state.nm.us).

La audiencia se llevará a cabo de acuerdo con 20.1.1 NMAC (Procedimientos de Reglamentación -- Dirección de Mejoras Medioambientales), la Ley de Mejoras Medioambientales, Sección 74-1-9 NMSA 1978, la Ley de Control de la Calidad del Aire, Sección 74-2-6 NMSA 1978 y otros procedimientos pertinentes.

A todas las personas interesadas se les dará una oportunidad razonable en la audiencia para presentar pruebas pertinentes, información, puntos de vista y argumentos, en forma oral o escrita, para someter por escrito a la Dirección indicando su intención de hacerlo. El aviso de intención debe:

- (1) identificar a la persona por quien el testigo (los testigos) dará(n) testimonio.
- (2) identificar a cada testigo técnico que la persona presentará e indicar la capacidad del testigo, incluso una descripción de su educación y antecedentes profesionales;
- (3) incluir una copia de las declaraciones directas en forma de narración de cada testigo técnico;
- (4) adjuntar cada prueba que la persona vaya a presentar en la audiencia; y
- (5) adjuntar el texto de cualquier modificación recomendada al propuesto cambio normativo.

Los avisos de intención para la audiencia deben recibirse en la oficina de la Dirección a más tardar para las 5:00 p.m. del 16 de agosto 2013 y deben hacer referencia al número del caso, EIB 13-02 (R) y la fecha de la audiencia. Los avisos de intención para presentar testimonios técnicos deben presentarse a:

Pam Castañeda, Board Administrator  
Office of the Environmental Improvement Board  
Harold Runnels Building  
1190 St. Francis Dr., Room N2 150  
Santa Fe, NM 87505  
Tel.: (505) 827-2425, Fax (505) 827-2636

Cualquier miembro del público en general puede dar declaraciones en la audiencia. No es necesario avisar previamente para dar declaraciones que no sean técnicas en la audiencia. También, cualquier persona puede ofrecer pruebas con relación a su testimonio, siempre y cuando dichas pruebas no sean exageradamente repetitivas del testimonio. Un miembro del público en general que en lugar de hacer declaraciones orales en la audiencia desee presentar una declaración por escrito para que conste en el acta, deberá registrar la declaración por escrito antes de la audiencia o la puede entregar en la audiencia, personas con discapacidades y que necesiten ayuda para participar en esta audiencia deben comunicarse con J. C. Borrego para el 16 de agosto 2013 en NMED, Human Resources Bureau, P.O. Box 5469, 1190 St. Francis Drive, Santa Fe, Nuevo México, 87502-5469, teléfono 505-827-0424. Los usuarios de TDY pueden acceder a su número vía New Mexico Relay Network en el 1-800-659-8331.

La Dirección puede tomar una decisión sobre el propuesto plan de implementación del estado revisado al concluir la audiencia o puede convocar a una reunión en una fecha posterior para considerar la acción sobre la propuesta.

Journal: June 28, 2013



## AFFIDAVIT OF PUBLICATION

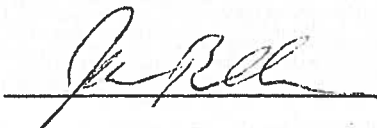
Ad No. 69196

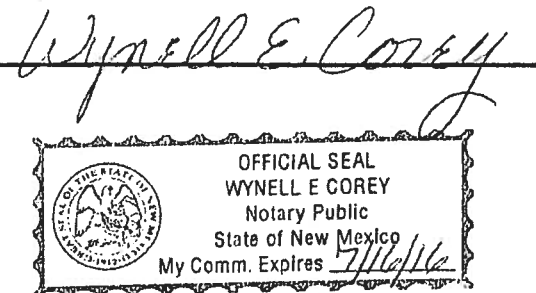
### STATE OF NEW MEXICO County of San Juan:

JOHN ELCHERT, being duly sworn says:  
That HE is the PUBLISHER of THE DAILY TIMES, a daily newspaper of general circulation published in English at Farmington, said county and state, and that the hereto attached Legal Notice was published in a regular and entire issue of the said DAILY TIMES, a daily newspaper duly qualified for the purpose within the meaning of Chapter 167 of the 1937 Session Laws of the State of New Mexico for publication and appeared in the Internet at The Daily Times web site on the following day(s):

Friday, June 28, 2013

And the cost of the publication is \$227.10

  
ON 7/8/13 JOHN ELCHERT  
appeared before me, whom I know personally  
to be the person who signed the above  
document.



## COPY OF PUBLICATION

### NEW MEXICO ENVIRONMENTAL IMPROVEMENT BOARD NOTICE OF STATE IMPLEMENTATION PLAN HEARING

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Legal No. 69196 published in The Daily Times on June 28, 2013.

## AFFIDAVIT OF PUBLICATION


Ad No. 69197

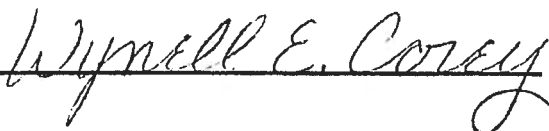
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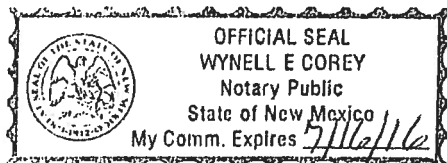
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Friday, June 28, 2013

And the cost of the publication is \$238.35

  
ON 7/9/13 JOHN ELCHERT  
appeared before me, whom I know personally  
to be the person who signed the above  
document.





## COPY OF PUBLICATION

DIRECCIÓN DE MEJORAS MEDIOAMBIENTALES  
DE NUEVO MÉXICO  
AVISO DE AUDIENCIA DE IMPLEMENTACION DE  
PLAN DEL ESTADO

La Dirección de Mejoras Medio-Ambientales de Nuevo México ("Dirección") tendrá una audiencia pública el 5 Septiembre 2013 a las 9:00 a.m. en la sala 7103 en San Juan College, 4601 College Blvd., seguida el 6 Septiembre 2013 (según sea necesario). El Departamento del Medio Ambiente de Nuevo México ("NMED", por sus siglas en Inglés) propone adoptar revisiones al Plan de Implementación del Estado de Nuevo México para la neblina regional. El plan propuesto establece requisitos para que Nuevo México cumpla los de 40 CFR Sección 51.309, incluso una determinación revisada de la Mejor tecnología de modernización para la estación generadora San Juan, situada 15 millas al occidente de Farmington. El plan propuesto involucra el retiro voluntario de dos de cuatro unidades en estas instalaciones y la instalación de una reducción no catalítica selectiva en otras dos unidades.

El Departamento del Medio Ambiente de Nuevo México ("NMED") es el que propone esta adopción y revisión reguladoras.

El propósito de la audiencia pública es considerar y tomar una posible acción sobre una petición del NMED con relación a las revisiones del Plan de Implementación del Estado de Nuevo México bajo la norma federal sobre neblina regional, 40 CFR Sección 51.309. La norma de neblina regional requiere que los estados presenten Planes de Implementación Estatal para tratar la falta de visibilidad causada por la neblina regional en 156 parques y áreas silvestres protegidos federalmente, las que se conocen como áreas de Clase I, e incluyen nueve en Nuevo México.

El propuesto plan modificado puede ser revisado durante las horas regulares de oficina, en NMED Air Quality Bureau, 525 Camino de los Marquez, Suite 1, Santa Fe, Nuevo México. El texto completo y revisado del propuesto Plan de Implementación está disponible en el sitio [www.nmenv.state.nm.us](http://www.nmenv.state.nm.us), o comunicándose con Rita Bates en el (505) 476-4304 o por correo electrónico: [rita.bates@state.nm.us](mailto:rita.bates@state.nm.us). La audiencia se llevará a cabo de acuerdo con 20.11 NMAC (Procedimientos de Reglamentación -- Dirección de Mejoras Medioambientales), la Ley de Mejoras Medioambientales, Sección 74-1-9 NMSA 1978, la Ley de Control de la Calidad del Aire, Sección 74-2-6 NMSA 1978 y otros procedimientos pertinentes.

A todas las personas interesadas se les dará una oportunidad razonable en la audiencia para presentar pruebas pertinentes, información, puntos de vista y argumentos, en forma oral o escrita, para someter pruebas e interrogar a testigos. Las personas que deseen dar testimonio técnico deben presentar un aviso por escrito a la Dirección indicando su intención de hacerlo. El aviso de intención debe:

- (1) Identificar a la persona por quien el testigo (los testigos) dará(n) testimonio.
- (2) identificar a cada testigo técnico que la persona presentará e indicar la capacidad del testigo, incluso una descripción de su educación y antecedentes profesionales;
- (3) incluir una copia de las declaraciones directas en forma de narración de cada testigo técnico;
- (4) adjuntar cada prueba que la persona vaya a presentar en la audiencia; y
- (5) adjuntar el texto de cualquier modificación recomendada al propuesto cambio normativo.

Los avisos de intención para la audiencia deben recibirse en la oficina de la Dirección a más tardar para las 5:00 p.m. del 16 de agosto 2013 y deben hacer referencia al número del caso, EIB 13-02 (R) y la fecha de la audiencia. Los avisos de intención para presentar testimonios técnicos deben presentarse a:

Pam Castañeda, Board Administrator  
Office of the Environmental Improvement  
Board  
Harold Runnels Building  
1190 St. Francis Dr., Room N2150  
Santa Fe, NM 87505  
Tel.: (505) 827-2425, Fax (505) 827-2836

Cualquier miembro del público en general puede dar declaraciones en la audiencia. No es necesario avisar previamente para dar declaraciones que no sean técnicas en la audiencia. También, cualquier persona puede ofrecer pruebas con relación a su testimonio, siempre y cuando dichas pruebas no sean exageradamente repetitivas del testimonio. Un miembro del público en general que en lugar de hacer declaraciones orales en la audiencia desee presentar una declaración por escrito para que conste en el acta, deberá registrar la declaración por escrito antes de la audiencia o la puede entregar en la audiencia. Las personas con discapacidades y que necesiten ayuda para participar en esta audiencia deben comunicarse con J. C. Borrego para el 16 de agosto 2013 en NMED, Human Resources Bureau, P.O. Box 5469, 1190 St. Francis Drive, Santa Fe, Nuevo México, 87502-5469, teléfono 505-827-0424. Los usuarios de TDY pueden acceder a su número vía New Mexico Relay Network en el 1-800-659-8331.

La Dirección puede tomar una decisión sobre el propuesto plan de implementación del estado revisado al concluir la audiencia o puede convocar a una reunión en una fecha posterior para considerar la acción sobre la propuesta.

Legal No. 69197 published in The Daily Times on June 28, 2013.









IN REPLY REFER TO:

7300 (930)

## United States Department of the Interior

### BUREAU OF LAND MANAGEMENT

New Mexico State Office

P.O. Box 27115

Santa Fe, New Mexico 87502-0115

[www.blm.gov/nm](http://www.blm.gov/nm)



July 22, 2013

Ms. Rita Bates  
Planning Section Chief  
Air Quality Bureau, New Mexico Environment Department  
525 Camino de los Marquez, Suite 1  
Santa Fe, NM 87505

Dear Ms. Bates:

Thank you for the opportunity to review the proposed revisions to the New Mexico Regional Haze State Implementation Plan based on the tentative settlement agreement between US EPA, Public Service Company of New Mexico (PNM) and the state of New Mexico. The revisions demonstrate that the state alternative for Best Available Retrofit Technology at PNM's San Juan Generating Station which includes installation of Selective Non-Catalytic Reduction on two units and shutting down two units achieves improvements to visibility similar to installation of Selective Catalytic Reduction on all four units, but at a lower projected cost and with a smaller operational environmental footprint.

We are in full agreement with the Department's conclusion and have no comments on the revisions.

Sincerely,

*James W. Seigler*, ACTING FOR

Michael H. Tupper  
Deputy State Director  
Division of Lands and Resources

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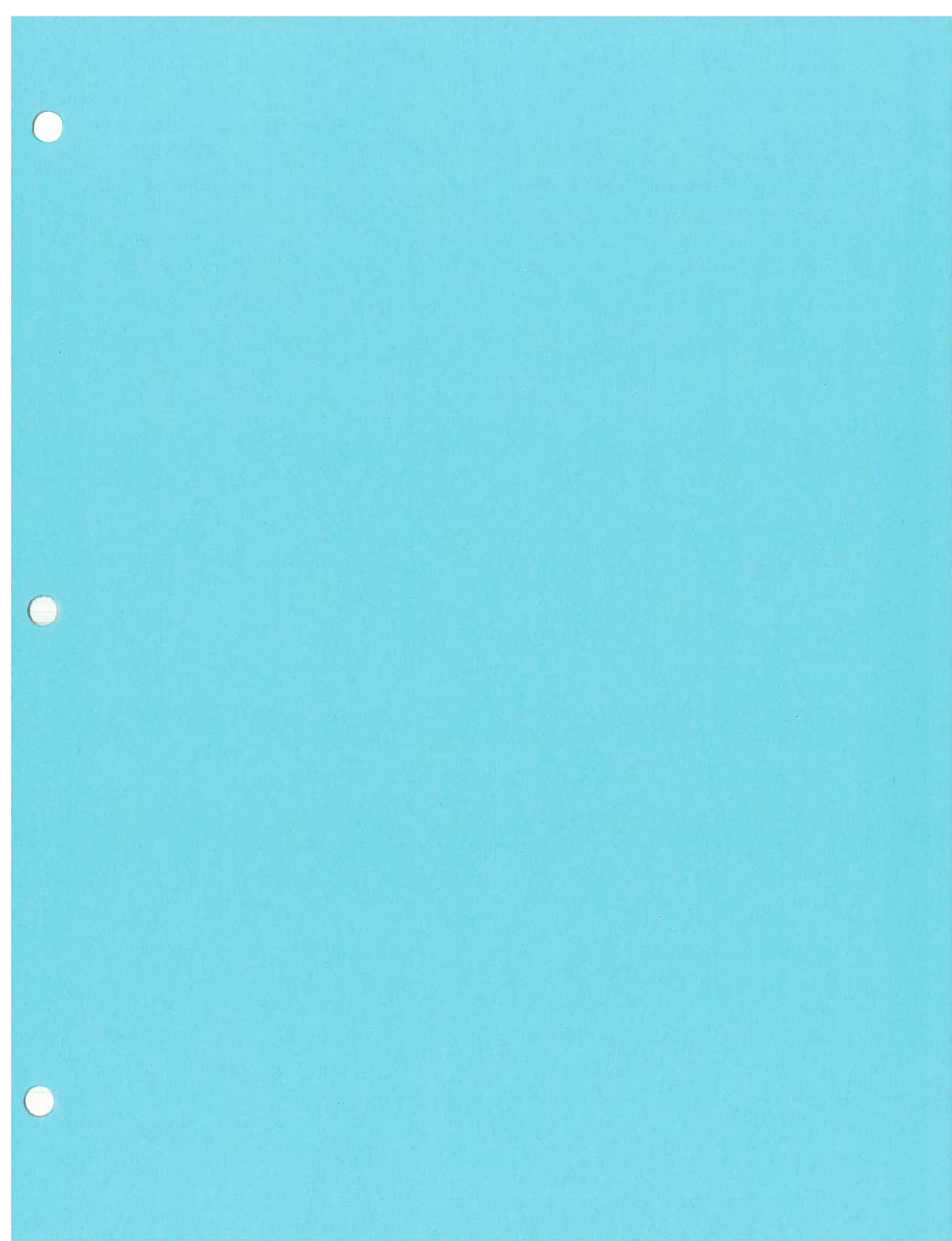
JUL 24 2013

Air Quality Bureau

NMED Ex. 8











IN REPLY REFER TO:

## United States Department of the Interior

### NATIONAL PARK SERVICE

Air Resources Division

P.O. Box 25287

Denver, CO 80225-0287

N3615 (2350)

July 24, 2013

Ms. Rita Bates  
Planning Section Chief, Air Quality Bureau  
New Mexico Environment Department  
525 Camino de los Marquez, Suite 1  
Santa Fe, NM 87505

Dear Rita:

Thank you for the opportunity to review and comment on the proposed State Alternative for Best Available Retrofit Technology for nitrogen oxide (NO<sub>x</sub>) emissions from San Juan Generating Station (SJGS). The State Alternative was developed through negotiation between New Mexico Environment Department (NMED), Public Service of New Mexico (PNM), and the Environmental Protection Agency (EPA) Region 6, after EPA disapproved New Mexico's BART determination for SJGS and proposed a Federal Implementation Plan (FIP) with more stringent controls.

PNM did not demonstrate that the State Alternative (Selective Non-Catalytic Reduction (SNCR) on two units and shut down of two units) is better than EPA's proposed BART determination (Selective Catalytic Reduction (SCR) on four units). PNM did not follow the BART guidelines to model maximum 24-hour emissions, so model results do not accurately estimate the visibility impacts. Actual 24-hour maximum NO<sub>x</sub> emissions should have been used for the baseline, and compared to the percentage emissions reductions for each control technology (23% for SNCR and 83% for SCR).

The State Alternative needs to demonstrate greater visibility improvement than the EPA FIP proposal. We recommend that PNM and NMED evaluate the feasibility of further lowering the emissions limits for NO<sub>x</sub> and/or SO<sub>2</sub> to demonstrate that the State Alternative is better than the EPA FIP proposal.

We also note that PNM overestimated the costs of SCR. We recalculated costs consistent with the BART guidelines and found that SCR costs are in the same range as accepted by other states as BART. Our detailed comments are enclosed.

**NMED Ex. 9**

We appreciate the opportunity to work closely with NMED to improve visibility at Class I national park units. If you have questions, please contact Don Shepherd at 303-969-2153 or [don\\_shepherd@nps.gov](mailto:don_shepherd@nps.gov).

Sincerely,



Susan Johnson  
Chief, Policy, Planning, and Permit Review Branch

Enclosure

cc:

Joe Kordzi  
EPA Region 6  
1445 Ross Ave., Dallas, TX 75202-2733

**National Park Service (NPS) Comments to New Mexico Environment Department (NMED)  
Regarding Best Available Retrofit Technology (BART) for the  
San Juan Generating Station (SJGS)**

July 24, 2013

**SJGS Source Description:**

SJGS is operated by the Public Service Company of New Mexico (PNM) and consists of four pulverized coal-fired generating units located near Farmington, NM. Coal for the units is supplied by the adjacent San Juan Mine and is delivered to the facility by conveyor. There are 16 Class I areas within 300 km of the SJGS facility, nine of which are administered by the NPS. At 40 km, Mesa Verde National Park is the closest Class I area. According to EPA's Clean Air Markets (CAM) database, of 1,213 facilities in 2012, SJGS ranked #176 for sulfur dioxide (SO<sub>2</sub>) emissions (4,604 tons) and #9 for nitrogen oxides (NO<sub>x</sub>) emissions (15,975 tons).

The SJGS Boiler Units 1 and 2 have a unit capacity of 350 and 360 MW, respectively. The units are equipped with Foster Wheeler subcritical, wall-fired boilers that operate in a forced draft mode. The SJGS Boiler Units 3 and 4 each have a unit capacity of 544 MW and are equipped with B&W subcritical, opposed wall-fired boilers that operate in a forced draft mode. Because plant capacity exceeds 750 MW, presumptive BART applies to each unit (greater than 200 MW).

The table below shows how each unit's 2012 CAM emissions ranked among the 3,495 Electric Generating Units (EGUs) in the CAM database.

Unit ID	SO <sub>2</sub> (tons)	SO <sub>2</sub> (tons) Rank	Avg. SO <sub>2</sub> Rate (lb/MMBtu)	Avg. NO <sub>x</sub> Rate (lb/MMBtu)	NO <sub>x</sub> (tons)	NO <sub>x</sub> (tons) Rank	CO <sub>2</sub> (tons)
1	952	626	0.081	0.278	3,352	133	2,473,030
2	864	653	0.078	0.290	3,302	136	2,319,354
3	1,137	579	0.074	0.271	4,278	91	3,227,133
4	1,652	475	0.089	0.267	5,042	58	3,886,720

**Consent Decree and Best Available Retrofit Technology (BART) proposals:**

On March 5, 2005, PNM entered into a consent decree with the Grand Canyon Trust, the Sierra Club, and the New Mexico Environment Department (NMED) to settle alleged violations of the Clean Air Act. The consent decree required PNM to meet a particulate average emission rate of 0.015 lb/mmBtu, and a 0.30 lb/mmBtu emission rate for NO<sub>x</sub> (daily rolling, thirty-day average), for each of Units 1, 2, 3, and 4. As a result, PNM installed Low-NO<sub>x</sub> burners with overfire air ports and a neural network system to reduce NO<sub>x</sub> emissions, and pulse jet fabric filters to reduce the particulate emissions. The consent decree also required that the annual rolling average SO<sub>2</sub> percentage reduction for SJGS Units 1, 2, 3, and 4 shall not be less than 90 percent for each unit.

The NM SIP dated July 5, 2011 determined BART for NO<sub>x</sub> for all four units as Selective Non-Catalytic Reduction (SNCR). The EPA Federal Implementation Plan (FIP) dated August 22, 2011 determined BART for NO<sub>x</sub> for all four units is the more stringent technology, Selective

Catalytic Reduction (SCR). PNM, NMED, and EPA negotiated the current proposed alternative BART that would shut down units 2 and 3 and install SNCR on units 1& 4.

### BART Analysis for Current Proposal

We agree with NMED that SNCR and SCR are feasible technologies and that the other technologies do not need to be evaluated further for SJGS (Steps 1 & 2).

#### Step 3: Evaluate Control Effectiveness of Remaining Control Technologies

NMED assumed that SNCR could reduce emissions by 23% (to 0.23 lb/mmBtu) and SCR by 83% (to 0.05 lb/mmBtu). However, we found seven wall- or tangentially-fired EGUs in EPA's 2012 CAM database operating at or below 0.04 lb/mmBtu (annual average). Three of these units (Morgantown #1 & #2, and W.A. Parish #7) were retrofit with SCR. (The other four units are new sources.) We believe that it is feasible for SJGS to achieve 0.04 lb/mmBtu on an annual average basis. This represents an 85% - 86% reduction in current NO<sub>x</sub> emissions, which is well within the capability of modern SCR.

#### Step 4: Perform Impacts Analysis of Remaining Control Technologies

Black & Veatch (B&V) and Sargent & Lundy (S&L) prepared the design parameters and developed estimates of capital and annual costs for applications of SCR and SNCR. PNM evaluated the energy impacts, non-air quality environmental impacts, and remaining useful life of all additional technically feasible control options for NO<sub>x</sub>. The 2013 analysis for 4 SCR, 4 SNCR and 2 SNCR/2 Shutdown used a remaining useful life of 30 years. The table below is a slightly-modified<sup>1</sup> version of NMED's Table 10 that focuses on SNCR and SCR compared to the baseline set by the 2005 Consent Decree.

**Table 10: Impact Analysis and Cost Effectiveness of Additional NO<sub>x</sub> Control Technologies**

Control Technology	Emission Performance	Expected Emission Rate (tpy)	Expected Emission Reduction (tpy)	Total Capital Investment (TCI) (1,000\$)	Total Capital Investment (\$/kW)	Total Annualized Cost	Cost Effectiveness (\$/ton)	Incremental Cost Effectiveness (\$/ton)
	Level (lb/MMBtu)					(TAC) (1,000\$)		
Unit 1 350 kW								
Consent Decree	0.30	4,140						
SNCR	0.23	3,174	966	17,392	50	5,400	5,590	\$ 6,749
SCR + sorbent (FIP)	0.05	690	3,450	180,862	517	22,165	6,425	
Unit 2 360 kW								
Consent Decree	0.30	4,119						
SNCR	0.23	3,158	961	17,392	48	5,400	5,618	\$ 7,752
SCR + sorbent (FIP)	0.05	687	3,433	203,360	565	24,562	7,157	
Unit 3 544 kW								

<sup>1</sup> Table 10 was modified to eliminate all control technologies except those under consideration in this proposal. Energy and non-air impacts were also deleted. EGU ratings were added.



Consent Decree	0.30	6,431						
SNCR	0.23	4,931	1,501	17,163	32	8,224	5,480	\$ 6,314
SCR + sorbent (FIP)	0.05	1,072	5,359	264,208	486	32,585	6,080	
<b>Unit 4</b> <span style="float: right;"><b>544 kW</b></span>								
Consent Decree	0.30	6,309						
SNCR	0.23	4,837	1,472	17,163	32	8,224	5,587	\$ 5,623
SCR + sorbent (FIP)	0.05	1,052	5,257	235,940	434	29,508	5,613	

In previous comments by EPA<sup>2</sup> and NPS, it was noted that unit costs (\$434 - \$565/kW) for SCR presented by PNM were far greater than industry and vendor<sup>3</sup> data support. In conducting our cost analysis for SCR, we used an approach similar to that reported by EPA Region 8 in its analysis of costs for the Colstrip Power Plant in MT:

We relied on a number of resources to assess the cost of compliance for the control technologies under consideration. In accordance with the BART Guidelines (70 FR 39166), and in order to maintain and improve consistency, in all cases we sought to align our cost methodologies with the EPA CCM.<sup>4</sup> However, to ensure that our methods also reflect the most recent cost levels seen in the marketplace, we also relied on a set of cost calculations developed by Sargent & Lundy for the Integrated Planning Model (IPM) version 4.10.<sup>5</sup> These IPM cost calculations are based on databases of actual control project costs and account for project specifics such as coal type, boiler type, and reduction efficiency. The IPM cost calculations reflect the recent increase in costs in the five years preceding 2009 that is largely attributed to international competition. Finally, our costs were also informed by cost analyses submitted by the sources, including in some cases vendor data.

We used EPA's IPM model to estimate Direct Capital Cost (DCC) and applied the Control Cost manual (CCM) factors (totaling 141%) for Indirect Capital Cost to estimate a Total Capital Investment (TCI). We then used the CCM to estimate (Direct and Indirect) Annual Costs. All SCR costs are normalized to 2010.

Unit	Unit 1	Unit 2	Unit 3	Unit 4
SCR Control Efficiency	86%	86%	85%	86%
Controlled emissions (lb/mmBtu)	0.04	0.04	0.04	0.04
Controlled Emissions (tpy)	484	455	635	751
Emissions Reduction (tpy)	2,942	2,826	3,716	4,473
Capital Cost	\$ 83,713,596	\$ 76,263,695	\$ 105,336,653	\$ 108,838,111
Capital Cost (\$/kW)	\$ 239	\$ 212	\$ 194	\$ 200
O&M Cost	\$ 2,526,966	\$ 2,336,481	\$ 3,219,734	\$ 3,529,493
Annualized Cost	\$ 9,273,143	\$ 8,482,298	\$ 11,708,436	\$ 12,300,365
Cost-Effectiveness (\$/ton)	\$ 3,152	\$ 3,001	\$ 3,151	\$ 2,750

<sup>2</sup> Five industry studies conducted between 2002 and 2007 have reported the installed unit capital cost of SCRs to be \$79/kW to \$316/kW, where the upper end of the range is for very complex retrofits that are severely site constrained.

<sup>3</sup> "The SCR System cost would range from \$100/Kw to \$200Kw. This was based on a unit size from 750 to 250MW." Email dated 4/21/10 from Anthony C. Favale P.E., Director - SCR Products, Hitachi Power Systems America, to Anita lee, EPA Region 9.

<sup>4</sup> EPA Control Cost Manual Sixth Edition, January 2002, EPA 452/B-02-001

<sup>5</sup> Documentation for EPA Base Case v.4.10 Using the Integrated Planning Model, August 2010, EPA #430R10010

Even with the increased catalyst volume necessary to meet the lower annual NO<sub>x</sub> emission rate for SCR, our \$194 - \$239/kW estimates of TCI still fall within the range of industry norms. Our annual costs are less than estimated by PNM, resulting in \$/ton estimates that are less than half PNM estimates.

#### **Step 5: Visibility Impacts Analysis of Remaining Control Technologies**

On April 1, 2013, PNM submitted updated visibility modeling for SJGS with revised emission estimates for SO<sub>2</sub>, sulfuric acid (H<sub>2</sub>SO<sub>4</sub>), and total particulate matter (TPM). The modeling analysis compared available NO<sub>x</sub> control technologies including SCR and SNCR, as well as unit retirements as an alternative operating scenario that had not previously been analyzed. PNM's updated BART modeling incorporated SJGS's new SO<sub>2</sub> and TPM emission limits of 0.15 lb/mmBtu and 0.034 lb/mmBtu, respectively, including the EPA's FIP scenario representing four SCRs, and the NMED's 2011 SIP scenario representing four SNCRs. PNM also modeled SO<sub>2</sub> at 0.10 lb/mmBtu. PNM utilized the EPA-approved CALPUFF version 5.8, the CALMET data set originally created by EPA, and modeling input files as modified by EPA to reflect the source-specific parameters for the specific modeling scenarios. The modeled CALPUFF domain, receptors, ozone data, and CALMET data came directly from EPA. Additionally, the surface, upper air, and precipitation stations used to make the CALMET files were also directly delivered from the EPA. In the 2013 analysis, the hourly ozone concentrations files that came directly from EPA were used and the ozone concentration of 80 ppb was used for the missing hours in the ozone data files. A constant ammonia background concentration of 1.0 ppb was used.

The NMED approved the use of all of the input parameters and data compiled by EPA for the updated modeling analysis. The condensable particulate matter (PM) emission rates used in the 2013 modeling were based on the facility's total particulate matter emission limit as established in the NSR permit effective August 31, 2012. PNM utilized the default ammonia background concentration of 1 ppb and the revised IMPROVE equation (Method 8) to calculate the 98<sup>th</sup> percentile delta deciview (dv) from modeled pollutant concentrations.

The meteorology used for the SJGS BART analysis followed EPA's methodology described in the Technical Support Document and included with EPA's proposed 2011 FIP. The modeling analysis was performed on a year-by-year basis (2001 – 2003) for the facility-wide impact for the four scenarios (Baseline, EPA FIP, NMED SIP, State Alternative).

Ammonia slip was not considered in the modeling analysis. According to NMED, "[C]onsidering the 1 ppb ammonia background and the reductions in NO<sub>x</sub>, ammonia slip would have a negligible impact on visibility from any of the scenarios. EPA had determined in the FIP that ammonia slip would not significantly impact visibility improvement due to reductions in NO<sub>x</sub> and SO<sub>2</sub> anticipated in the 4-SCR scenario." This is misleading because the EPA statement<sup>6</sup> was in regard to SCR ammonia slip—EPA never addressed ammonia slip from SNCR, which can be much higher than from SCR.

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<sup>6</sup> EPA TSD: "We are proposing NO<sub>x</sub> reductions that would likely be met with the installation of SCR and would have associated ammonia slip (ammonia that is not fully reacted and is emitted to atmosphere). The ammonia slip limit may be higher than 1 ppb, but we don't think it would significantly impact visibility improvements due to the reductions in NO<sub>x</sub> and SO<sub>2</sub> at the SJGS units."

### CALPUFF Inputs –Baseline and Control Options

Source release parameters and emissions for baseline and control options for each unit are shown in NMED's Tables 16 through 19. The following notes apply to each of these tables:

- (1) Emissions levels (lb/mmBtu) are shown on an annual average basis.
- (2) Emissions (lb/hr) calculations were based on the emissions level (lb/mmBtu) and design heat basis.
- (3) Emissions levels listed were based on performance guarantees provided by the equipment vendor.
- (4) The 2013 analysis utilizes the Electric Power Research Institute (EPRI) methodology to estimate H<sub>2</sub>SO<sub>4</sub> emissions.

The 2013 analysis used the revised IMPROVE equation (Method 8) and the Annual Average Natural Conditions.

However, the emissions modeled do not follow the BART Guidelines. Instead of modeling the maximum 24-hour emission rates as required by the BART Guidelines<sup>7</sup>, the 2013 analysis relies upon annual/30 day rolling? (please clarify) average emissions, which do not properly reflect the variability in 24-hour emissions. To represent control technology, PNM should have used actual maximum 24-hr emissions modified by the percentage emissions reduction from Table 2, Appendix D (23% for SNCR and 83% for SCR). As would be expected, the baseline annual average SO<sub>2</sub> and NO<sub>x</sub> emissions modeled in the 2013 analysis are consistently lower than the corresponding 24-hour maxima, as shown in the table below. (The "NMED" values are the modeled emission rates, while the "CAMD" values are the 24-hour maxima and the dates on which they occurred.)

Baseline	Unit	1	Date	2	Date	3	Date	4	Date
NMED	SO <sub>2</sub> (lb/hr)	556.1		553.2		863.7		847.4	
CAMD	SO <sub>2</sub> (lb/hr)	598.3	4/17/2010	598.1	6/22/2012	988.0	12/22/2012	1,360.7	8/1/2012
NMED	NO <sub>x</sub> (lb/hr)	1,112.1		1,106.4		1,727.4		1,694.7	
CAMD	NO <sub>x</sub> (lb/hr)	1,203.8	8/30/2012	1,105.2	7/25/2012	1,795.5	7/19/2012	1,893.1	6/3/2010

PNM also erred by assuming that future 24-hour maximum emissions would be the same as the longer-term emission limits. Even though no additional SO<sub>2</sub> control measures are proposed, PNM has assumed that SO<sub>2</sub> emissions will be reduced by one-third from the "baseline" condition. PNM appears to be lowering allowable emissions limit closer to the demonstrated actual emissions without changing operational conditions. Thus the emissions reduction that SJGS is taking credit for is not actually a reduction. This significant, but "paper", reduction in SO<sub>2</sub> emissions is likely to have played a major role in NMED's conclusion that the State Alternative is almost as good as BART. Without this paper SO<sub>2</sub> reduction, it is likely that reductions from the State Alternative would be much less. Instead of modeling this "paper" SO<sub>2</sub>

<sup>7</sup> Scenarios would be run for the pre-controlled and post-controlled emission rates for each of the BART control options under review. The maximum 24-hour emission rates would be modeled for a period of three or five years of meteorological data.

reduction, PNM should model future maximum 24-hour emission based upon application of expected improved control efficiencies to the actual baseline emissions from CAM data.

### **Discussions and Conclusions**

Because of the modeling errors discussed above, we cannot evaluate the State's conclusion that:

The State Alternative Plan (2 SNCR/2 Shutdown) and the EPA FIP (4 SCR) achieve greater visibility improvement than projected for the NMED SIP scenario of 4 SNCR. The State Alternative Plan provides for nearly the same visibility improvement as the EPA FIP in improving visibility, with a difference of less than 0.5 dv at any one Class I area. The largest average differences in visibility improvement from the 4 SCR (FIP) and 2 SNCR/2 Shutdown (State Alternative) scenarios are 0.28 dv at Mesa Verde National Park, and 0.16 dv at Canyonlands National Park.

Instead, NMED should address the modeling issues we have identified and present corrected results and conclusions. (It would also be helpful if NMED would present its results in tabular form, in addition to the chart format.)

### **2013 BART Determination**

NMED states that it "considered the terms of the non-binding agreement between the EPA, NMED and PNM, signed February 15, 2013 (the "State Alternative"), and the resulting significant environmental improvements of this alternative and compared this scenario to the 4 SNCR and 4 SCR scenarios previously evaluated:"

The retirement of Units 2 and 3 will reduce the facility annual NO<sub>x</sub> emissions by an additional 10,550 tons. When added to the controlled emission rate of Units 1 and 4, total annual NO<sub>x</sub> emission will be reduced by 12,989 tons.

We are not clear on the bases for the statement above.

Under this BART alternative, PNM is to conduct performance testing to determine if the SNCRs installed on Units 1 and 4 can achieve significantly less than 0.23 lb/mmBtu. Given that a similar optimization condition<sup>8</sup> is contained in the consent decree, please describe how that condition in that consent decree has been implemented.

NMED states that:

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<sup>8</sup> No later than sixty (60) days after the first twelve (12) months of operation of the new NO<sub>x</sub> combustion control technology installed at each unit, PNM shall submit a report to Plaintiffs and the Department (a) identifying the daily average NO<sub>x</sub> emission rate for each unit for every operating day in the period and the thirty (30) day rolling average emission rate for every calendar day of the period, (b) describing the performance of the NO<sub>x</sub> control technology at each unit, and (c) evaluating the extent to which the 0.30 lb./mmBtu limit can be lowered at each unit based on the performance of each unit during the first twelve (12) months of operation of the new NO<sub>x</sub> combustion control technology. The report shall be reviewed pursuant to the procedure in Section IX (Approvals). Upon approval of Plaintiffs and the Department, the 0.30 lb./mmBtu limit shall be adjusted to a lower limit for the unit if the data gathered during the first twelve (12) months of operation indicate that a given unit is capable of meeting a lower limit, provided, however, that any final NO<sub>x</sub> limit for a given unit shall add a ten (10) percent margin of safety to the most representative thirty (30) day average emission rate achieved during the first twelve (12) months of operation.

The visibility improvements from the State Alternative of SNCR on two units and two units shutdown compare very closely with the SCR installation scenario as contained in the FIP...the degree of visibility improvement anticipated, the 2 SNCR/2 unit shutdown scenario is superior to the 4 SNCR scenario, and substantially equivalent to the 4 SCR scenario.

Even if the visibility modeling results are accepted at face value, they do not demonstrate that the 2 SNCR/2 unit shutdown alternative is "better-than-BART." And, both the EPA FIP and the State Alternative continue to show more than a 2 dv impact at Mesa Verde NP, continued visibility impairment at Canyonlands NP, and continued contributions to impairment at four more Class I areas.

NMED concludes that:

The total capital investment of the FIP 4 SCR scenario is estimated at nearly \$861,871,000, as compared to \$34,556,000 for the installation of SNCR at Units 1 and 4. This additional and significant capital expenditure that would be required to comply with the FIP 4 SCR scenario is not justified given the slight and undetectable improvement in visibility of the FIP 4 SCR scenario over the State Alternative 2 SCR/2 Shutdown scenario.

We have shown that the total capital investment estimates cited by NMED for SCR are overestimated (our \$194 - \$239/kW estimates versus \$434 - \$565/kW by PNM), and that the visibility modeling needs revision.

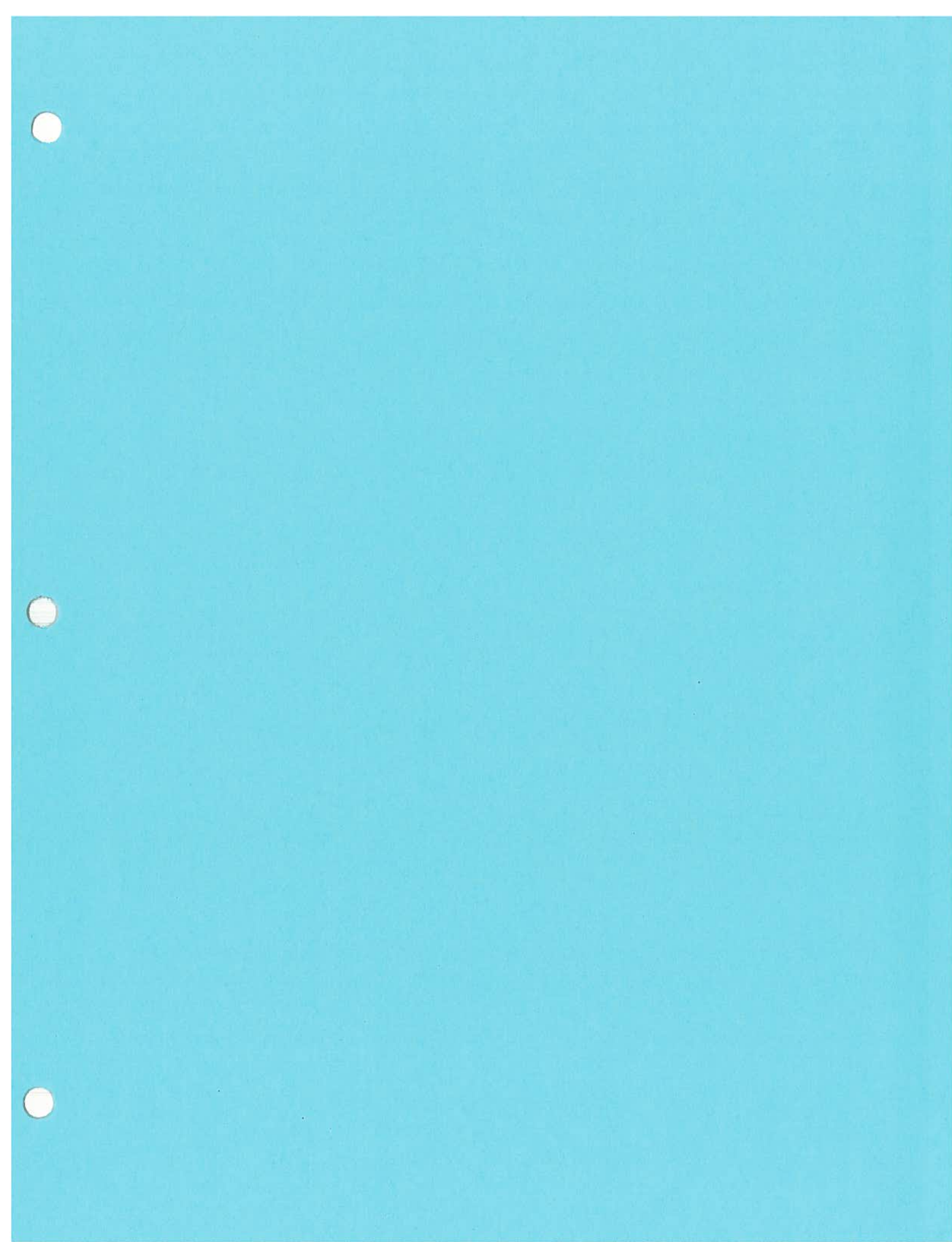
### **Conclusions**

- Cost estimates for SCR are significantly overestimated.
- The visibility modeling analysis was not done according to the BART Guidelines.
- The visibility modeling analysis does not demonstrate that the 2 SNCR/2 unit shutdown alternative is "better-than-BART."
- Without additional SO<sub>2</sub> or NO<sub>x</sub> reductions beyond those proposed in the State Alternative, the National Park Service does not agree that the State Alternative is better than the BART determination in EPA's FIP.

### **Recommendations**

While addressing the problems noted above, NMED should also evaluate the possibility of reducing actual SO<sub>2</sub> emissions and setting a limit on SO<sub>2</sub> lower than the proposed 0.10 lb/mmBtu (30-day rolling average). For example, our review of CAM data shows that Unit #1 operated with 30-day rolling averages at or below 0.080 lb/mmBtu between 5/17/2010 and 3/26/2012. During 2010 – 2012, Unit #4 operated with 30-day rolling averages below 0.080 lb/mmBtu 52% of the time, and below 0.09 lb/mmBtu 77% of the time. So, it appears that the scrubbers have the capability to operate with lower than 0.10 lb/mmBtu SO<sub>2</sub> emissions. It may be feasible to improve operation and maintenance of the scrubbers on units #1 & #4 such that they can consistently meet a lower SO<sub>2</sub> limit.









**STATE OF NEW MEXICO  
BEFORE THE ENVIRONMENTAL IMPROVEMENT BOARD**

**IN THE MATTER OF PROPOSED REVISIONS  
TO THE STATE IMPLEMENTATION PLAN  
FOR THE SAN JUAN GENERATING STATION  
BEST AVAILABLE RETROFIT TECHNOLOGY  
DETERMINATION**

**No. EIB 13- 02(R)**

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**NMED EXHIBIT 10 – Written Testimony of Ted Schooley**

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**Statement of Witness Qualifications**

Ted Schooley has served as the Permitting Programs Manager of the Air Quality Bureau of the New Mexico Environment Department (“NMED”) since May, 2013. He began with the Bureau in May of 2001 as the Minor Source Manager, and later served as the Technical Services Manager of the Permitting Section in the Bureau. Mr. Schooley holds a Bachelor of Science degree in Mechanical Engineering from Louisiana State University, New Orleans, as well as a Bachelor of Science in Math and Physics from the University of Texas at El Paso. He is a registered Professional Engineer in mechanical engineering in the State of Louisiana. His resume is attached as Exhibit 10a.

**Testimony**

1           My name is Ted Schooley and I am the Permitting Programs Manager for the Air Quality  
2 Bureau within NMED. The purpose of my testimony is to describe the stakeholder process that  
3 informed the February 15, 2013 tentative agreement (the “Term Sheet”) between the NMED,  
4 Public Service Company of New Mexico (“PNM”), and the U.S. Environmental Protection  
5 Agency (“EPA”) to address regional haze and visibility transport requirements for the San Juan  
6 Generating Station (“SJGS”); to explain the purpose and mechanism of the Testing Program  
7 provided in paragraph 1.d of this Term Sheet, and to affirm the Department’s support for the  
8 “State Alternative” contained in the Term Sheet as the State’s BART determination for the  
9 SJGS.

1           **Background**

2           On June 2, 2011, this Board adopted a regional haze state implementation plan ("SIP")  
3           that included New Mexico's determination of Best Available Retrofit Technology ("BART") for  
4           the PNM San Juan Generating Station ("SJGS"). This plan required the installation of Selective  
5           Non-Catalytic Reduction ("SNCR") controls, with a NOx emission limit of 0.23 lbs/MMBtu and  
6           an estimated total capital invest of approximately \$76 million. On June 24, 2011, Governor  
7           Martinez submitted the SIP to the Environmental Protection Agency ("EPA") for approval (EPA  
8           received the SIP on July 5, 2011).

9           On August 22, 2011, without taking action to approve or disapprove New Mexico's SIP,  
10          the EPA promulgated a federal implementation plan ("FIP") imposing a different BART limit on  
11          the San Juan Generating Station. This federal plan required the installation of Selective Catalytic  
12          Reduction ("SCR") controls with a NOx emission limit of 0.05 lbs/MMBtu, at a total cost that  
13          EPA estimated to be \$345 million, but which PNM estimated to be between \$740 million and  
14          \$860 million.

15          On October 21, 2011, New Mexico petitioned for judicial review of EPA's FIP in the  
16          United States Court of Appeals for the Tenth Circuit, as provided for by the Clean Air Act.  
17          Among other issues, New Mexico challenged EPA's decision to issue this FIP without first  
18          determining whether New Mexico's SIP fully satisfied the Act, because only if the SIP were  
19          found to be deficient would EPA have the statutory authority to issue a FIP. New Mexico argued  
20          that EPA's duty to consider the SIP was especially clear in the context of BART determinations,  
21          because Congress expressly delegated decisions on BART to the States. The state also filed a  
22          motion asking the court to stay the FIP pending the outcome of the litigation. On March 1, 2012,  
23          the court denied that motion, without issuing an opinion.

1 In response to these events, on April 26, 2012, New Mexico Governor Susana Martinez  
2 wrote EPA Administrator Lisa Jackson a letter requesting a 90-day stay of the federal rule “in  
3 order to create a structure in which discussions of potential solutions to the regional haze dispute  
4 can occur.” Governor Martinez further explained:

5 “I initiated [a lawsuit] against the EPA because I could not stand idly by as EPA  
6 infringed on New Mexico’s rights and moved to impose a significant economic burden  
7 on our citizens. However, I believe we owe it to taxpayers to see if we can avoid further  
8 litigation by resolving this dispute outside of the courtroom. Therefore, I am urging  
9 EPA, Public Service Company of New Mexico (PNM) and other interested stakeholders  
10 to evaluate whether there are any viable alternatives to the BART FIP that will be in both  
11 the environmental and economic best interests of New Mexico.”  
12

13 In response to Governor Martinez’s request, on July 2, 2012, Administrator Jackson  
14 signed an order staying the effectiveness of the FIP for 90 days from the date of publication in  
15 Federal Register. The order was published in the Federal Register on July 16, 2012, (77 Fed.  
16 Reg. 41,697) and a 45 day extension of administrative stay was subsequently published on  
17 October 24, 2012 (77 Fed. Reg. 64,908). Although by their express terms these actions stayed  
18 only the effective date of the FIP and did not alter the ultimate compliance deadline of  
19 September 21, 2016 for installation of SCR, EPA indicated in the order it would take future  
20 action to extend that deadline or account for an alternative proposal.

### 21 **Stakeholder Process**

22 In order to accomplish the evaluation of other alternatives called for by Governor  
23 Martinez, the Department conducted a stakeholder outreach process. The process was organized  
24 and facilitated by then-General Counsel Ryan Flynn. I participated in it along with Liz Bisbey-  
25 Kuehn, also of the Air Quality Bureau, to provide technical support. The process began in July,  
26 2012, when the Department published its Proposed Stakeholder Outreach Plan to establish a  
27 broad, consensual goal with stakeholders, EPA, and PNM, and to determine if an alternative plan

1 was feasible. This plan included a series of public meetings and the convening of a Technical  
2 Work Group of stakeholder representatives and experts.

3 In accordance with the plan, the Department then held a series of public meetings  
4 in July and August, 2012, in venues accessible to the local stakeholders. The principal  
5 stakeholders identified included local communities, consumers, the Navajo Nation,  
6 environmental and public health groups, industry, PNM, and federal, state, and local leaders.

7 These public meetings were held in:

- 8 1. Farmington, July 24, to address local community concerns;
  - 9 2. The Navajo Nation, August 9, to address the tribe's concerns;
  - 10 3. Albuquerque, August 13, to address consumer and ratepayer concerns; and
  - 11 4. Farmington, August 20, to address environmental and public health concerns.
- 12

13 In addition to these public meetings, the Department organized a Technical Work Group  
14 comprising stakeholder representatives and experts. The Department held a series of Technical  
15 Work Group meetings, facilitated by an independent professional facilitator. The meetings  
16 provided technical input to assist the Department with evaluating whether a viable alternative  
17 existed and, if so, to make recommendations concerning its nature.

18 The Technical Work Group included representatives from the Navajo Nation, New  
19 Mexico Public Regulation Commission, WildEarth Guardians, New Mexico Industrial Energy  
20 Consumers, the Sierra Club, Four-Corners Economic Development, Inc., the City of Farmington,  
21 Western Environmental Law Center, Western Resource Advocates, the U.S. Forest Service,  
22 PNM, the Department, New Energy Economy, and Amigos Bravos.

23 The Technical Work Group did not reach a consensus around any specific plan, and not  
24 all of the groups mentioned above support the State Alternative. However, despite the diversity  
25 of stakeholder interests, there was general agreement on the additional factors that should be

1 considered in developing a regional haze strategy for the SJGS – including the impact on jobs  
2 and the capital cost of any proposal. There was also broad agreement that the shutdown of units  
3 was an appropriate element of an alternative plan.

4 After considering the input of the various stakeholders, on October 2, 2012, the  
5 Department announced that it had formulated a proposed alternative. This plan featured the  
6 shutdown of SJGS Units 1 and 2 and the installation of SNCR emission controls on Units 3 and  
7 4. The Department found that the alternative would result in similar emission reductions  
8 required by EPA's Federal Implementation Plan at a fraction of the costs, and deliver additional  
9 environmental benefits. Chief among these is that it would reduce not only NO<sub>x</sub> but SO<sub>2</sub>,  
10 mercury, particulates, and carbon; reduce water usage and coal ash production; and allow for  
11 greater fuel diversity by avoiding unnecessary over-commitment to coal fired power.

#### 12 **Post-Stakeholder Process**

13 Because EPA and the Department could not agree on a mechanism to provide relief from  
14 the September 21, 2016 compliance deadline, briefing of the Tenth Circuit challenges to the FIP  
15 continued while the stakeholder process proceeded during the summer of 2012, with oral  
16 arguments scheduled for October 23, 2012. As that date approached, the Department's efforts  
17 shifted from obtaining additional stakeholder input on alternatives, to intensive negotiations with  
18 EPA and PNM to try to reach an agreement based on the proposed "State Alternative." These  
19 efforts then continued on past the date of oral arguments, including a round of focused, in person  
20 discussions between the EPA, the NMED, and PNM, held from November 13 through November  
21 16, 2012, in which I participated. Eventually, in February of 2013, the discussions resulted in  
22 the tentative agreement memorialized with the signing of the Term Sheet.

1 The Term Sheet agreement differs from NMED's originally proposed State Alternative  
2 primarily in the following ways: First, the units to be retired were changed from 1 & 2 to 2 & 3.  
3 Because Unit 3 is larger than unit 1, this results in larger reductions of all pollutants (by  
4 approximately 22%). Second, the Term Sheet adds the requirement that the SO<sub>2</sub> emission limit  
5 from remaining units 1 & 4 be reduced by 33%, from 0.15 to 0.10 lb/MMBtu. Third, the Term  
6 Sheet also adds provisions requiring testing and fine tuning of the SNCR controls on units 1 & 4  
7 to determine if a lower rate than 0.23 lbs/MMBtu can be achieved. Finally, under the Term  
8 Sheet, PNM agrees to perform a best available control technology ("BACT") determination for  
9 the natural gas turbine to be installed at San Juan to partially replace the power of retired units 2  
10 & 3, and to limit NO<sub>x</sub> emission from that turbine to no more than 75 tons per year.

11 **Selective Non-Catalytic Reduction ("SNCR") Testing Program**

12 Paragraph 1.d. of the Term Sheet provides a post-SNCR installation Testing Program.  
13 This Testing Program consists of three parts: (1) SNCR Performance Testing (2) Fuel  
14 Performance Testing, and (3) Long-Term Performance Evaluation, as described below.

15 *SNCR Performance Testing*

16 The ammonia/urea reagents are injected into the flue gas stream to react with NO<sub>x</sub>, thus  
17 reducing NO<sub>x</sub> emissions. Invariably, this reaction is not 100% efficient, resulting in some  
18 fraction of these reagents being emitted to the atmosphere. The amount being emitted is referred  
19 to as the "slip." While it reduces NO<sub>x</sub> emissions, ammonia in the flue gas stream has multiple  
20 negative impacts including odors, health concerns, potential visibility impacts, and equipment  
21 fouling.



1 The Term Sheet limits the acceptable ammonia/urea injection rates such that they do not  
2 result in a slip of less than 5 ppm because it has been empirically determined that for similar  
3 installations, the NOx Reduction Efficiency is dramatically reduced below this slip level.

4 The Term Sheet limits the maximum slip to 10 ppm because at higher slip values the  
5 return in increased NOx reduction efficiency gained by doing so does not justify increasing the  
6 aforementioned negative impacts.

7 The SNCR Performance Testing is pre-Long-Term Performance Evaluation testing to  
8 develop a targeted ammonia/urea injection rate range over various load levels without exceeding  
9 a to-be-agreed-upon preliminary slip limit of between 5 and 10 ppm, with the goal of minimizing  
10 NOx emissions. These ammonia/urea injection rates corresponding to various load levels will be  
11 used in the Long-Term Performance Evaluation Period phase of this testing program. The terms  
12 of the SNCR Performance Testing protocol also provide responsibilities and performance dates  
13 for the various parties to concur on a slip limit that PNM will comply with for SJGS Units 1 and  
14 4.

#### 15 *Fuel Performance Testing*

16 PNM can possibly reduce NOx emissions by pre-treating the coal it uses for fuel. The  
17 purpose of this Fuel Performance Testing protocol is to demonstrate that this pre-treating coal  
18 technology does not:

- 19 1) Measurably increase NOx emissions
- 20 2) Adversely impact overall unit operations

21 If this Fuel Performance Testing does not measurably increase NOx emissions or  
22 adversely impact overall unit operations, this pre-treated coal shall be used in the Long-Term  
23 Performance Evaluation Period to determine the NOx emission limit for SJGS Units 1 and 4.

1 The Fuel Performance Testing and pre-treated coal will not be required if it is determined to  
2 result in any detrimental effect to Units 1 and 4. PNM is also required to use pre-treated coal on  
3 Units 2 and 3 when used on Units 1 and 4.

4 *Long-Term Performance Evaluation Period*

5 The purpose of the Long-Term Performance Evaluation Period is to determine a new,  
6 more appropriate, NOx emission rate if the Long-Term Performance Evaluation Period indicates  
7 the actual NOx emissions are substantially lower than the 0.23 lb/MMBtu on a daily rolling 30-  
8 day average basis emission rate established in paragraph 1.c of the Term Sheet. The targeted  
9 ammonia/urea injection rates corresponding to various load levels established in the SNCR  
10 Performance Testing and the pre-treated coal, if its use is appropriate, will ensure the actual NOx  
11 emissions measured in the Long-Term Performance Evaluation Period are the lowest practicably  
12 achievable. These actual NOx emission rates will be compared to the 0.23 lb/MMBtu on a daily  
13 rolling 30-day average basis emission rate. The Long-Term Performance Evaluation Period  
14 paragraph of the Term Sheet provides criteria for determining whether the actual NOx emission  
15 rate is substantially lower than 0.23 lb/MMBtu, and, if it is, a formula for determining the new,  
16 lower NOx emission limit. This paragraph also requires PNM to apply for a permit modification  
17 by March 31, 2017 to include both the resulting NOx emission rate, if it is lower than the 0.23  
18 lb/MMBtu on a daily rolling 30-day average basis emission rate, and the agreed upon ammonia  
19 slip.

20 **Department's Position on the State Alternative**

21 The Department strongly supports adoption of the State Alternative as a revised BART  
22 determination for the San Juan Generating Station. As the modeling shows, this option will  
23 achieve visibility improvements at each of the 16 affected Class I areas that are within 0.5

1    deciview of the improvements achieved by EPA's FIP, a difference that is undetectable by the  
2    average person. In several cases, the State Alternative will achieve greater visibility  
3    improvements than the FIP. It will do this for a total capital investment of approximately \$34  
4    million for SNCR at two units, a fraction of the hundreds of millions required by the FIP. The  
5    State Alternative complies with the provisions of the Term Sheet, and will satisfy the SJGS's  
6    obligations under the visibility and interstate transport provisions of the Clean Air Act.

7           Equally important to the Department, the State Alternative avoids requiring PNM to  
8    install costly pollution control retrofits to all four of its units, which would involve investment of  
9    on the order of \$860 million. Such an investment would not appreciably improve visibility any  
10   more than would the State Alternative, but would effectively lock the SJGS into coal-fired  
11   production at all four units for decades to come. This would significantly impede New Mexico's  
12   efforts to transition to a more diverse and less carbon-intensive mix of energy sources. This  
13   would be true even if the ultimate cost of the FIP is closer to EPA's estimate of \$345 Million.  
14   Finally, as documented in the Department's BART determination, the State Alternative would  
15   result in a 62% reduction in nitrogen oxides, a 67% reduction in SO<sub>2</sub>, a 50% reduction in carbon  
16   dioxide, particulate matter, mercury, and volatile organics, up to a 53% reduction in water usage,  
17   and a up to a 50% reduction in coal ash generated. The FIP, in contrast would reduce emissions  
18   of only nitrogen oxides, and would not do anything to reduce water use or coal ash generation.

19           For all of these reasons, NMED respectfully requests that the Board adopt the State  
20   Alternative as BART for the SJGS, as contained in the June 27, 2013 public comment version of  
21   the proposed revisions to Chapter 10 and Appendix D of New Mexico's regional haze state  
22   implementation plan.







# Ted Schooley

## Curriculum Vitae

### Summary of Qualifications

- Registered Professional Engineer, State of Louisiana (Mechanical)
- 24 years successful experience in small and medium business management
- Experience in HR management including recruitment, development, and retention of personnel
- Skilled in engineering, business management, customer service, and problem solving
- Solid knowledge of Window software applications, various special purpose software programs (HTML web site design, 3D CAD, desktop publishing, graphics design, video editing, etc.), as well as customization of proprietary software

### Management Flexibility and Accomplishments:

- **Entrepreneurial Skills:** Conceptualized, created, and managed **CompServCo**, a successful software development, marketing, and fulfillment company that produced a product MacCAD that won a "Top 100 Macintosh Products" award. CompServCo also won fulfillment contracts (packaging design, packaging, and shipping) for several other engineering software products. These contracts also included co-marketing efforts such as multi-product display ads in national magazines, technical support, packaging and national trade shows.
- **Marketing:** After a few years, CompServCo won the exclusive North American distributorship of a proprietary 3-D CAD kitchen design software product, Planit. To fulfill this contract, CompServCo spun off another software distributing company, **Planit USA**. In return for a lucrative distributing contract, CompServCo though Planit USA, capitalized the marketing and database development of Planit in the USA, and brought this new product from being unknown in this vertical market to a market leader within a few years. Sold the company in 1997.
- **Contract Negotiations:** 11 years experience in upper management level contract negotiations with major manufacturing firms in the United States, Canada, and Europe (i.e. Masco, Woodmode, Aristocraft, Craftmaid, and Merillat).
- **Sales & Marketing:** Over 17 years experience in marketing, sales, and customer service. Responsible for conceptualizing and coordinating a national marketing campaigns for several software products, including personally creating display ads, internet advertising (web site & e-mail campaigns), national trade shows (booth design and marketing focus), and negotiating co-marketing efforts. As VP Sale & Marketing, I grew a commercial print shop to win American Printing Magazine's "Top 50 Fastest Growing Printing Companies" award. I also put systems in place to diversify the sales base and move the company to web-based publishing.
- **Software Development:** Managed software programmers developing various products for CompServCo: MacCAD (3-D graphic engineering templates), Riddler (teaching software that incorporated text-graphics-sounds in a gaming style user interface), My Family Tree (genealogy software that mapped and produced a family book with text and photos), Planit Cut List (produced a cut list of panel parts and sizes from a list of kitchen cabinets).
- **Engineering: Space Shuttle External Tank:** As a facilities design engineer for Martin Marietta, under contract to NASA, building the External Tank for the Space Shuttle I designed and managed construction of a dust collection system for Thermal Protection System (TPS) machining facility, re-designed a faulty lifting hook and insertion mechanism that inserted an umbrella-like washing probe into the interior of the liquid hydrogen portion of the space shuttle external tank, designed and oversaw the TPS application on an emergency basis on the dome of the LOX (liquid oxygen) tank of the External Tank used in the first Space Shuttle flight.

- **Engineering & Manufacturing Management:** Starting as an engineer at Dixie Manufacturing, I co-designed pneumatic instrumentation that sensed emergency conditions at the oil wellhead and shut down all operations using pneumatics only (no electricity or sparks to ignite fuel). After being promoted to General Manager, I was responsible for all aspects of production and marketing of the company's products. In my youth, I started a jewelry manufacturing business that successfully mass produced and marketed silver and gold jewelry before returning to school to obtain my engineering degree.
- **Environmental Regulatory Management:** 12 years experience managing permitting programs (New Source Review and Technical Services Units) of the Air Quality Bureau, New Mexico Environment Department. Responsible for overseeing of constructing permitting (new sources and source modifications) for all applicable sources of air pollution in the State of New Mexico. Under my management there was a marked increase in the quality of permit review, permitting guidance, as well as timeliness and quality of permits issued. Additionally, finding the unit's team spirit and job satisfaction at remarkably low levels, I initiated programs and management style to bring the team spirit to a high degree of harmony and sense of purpose.

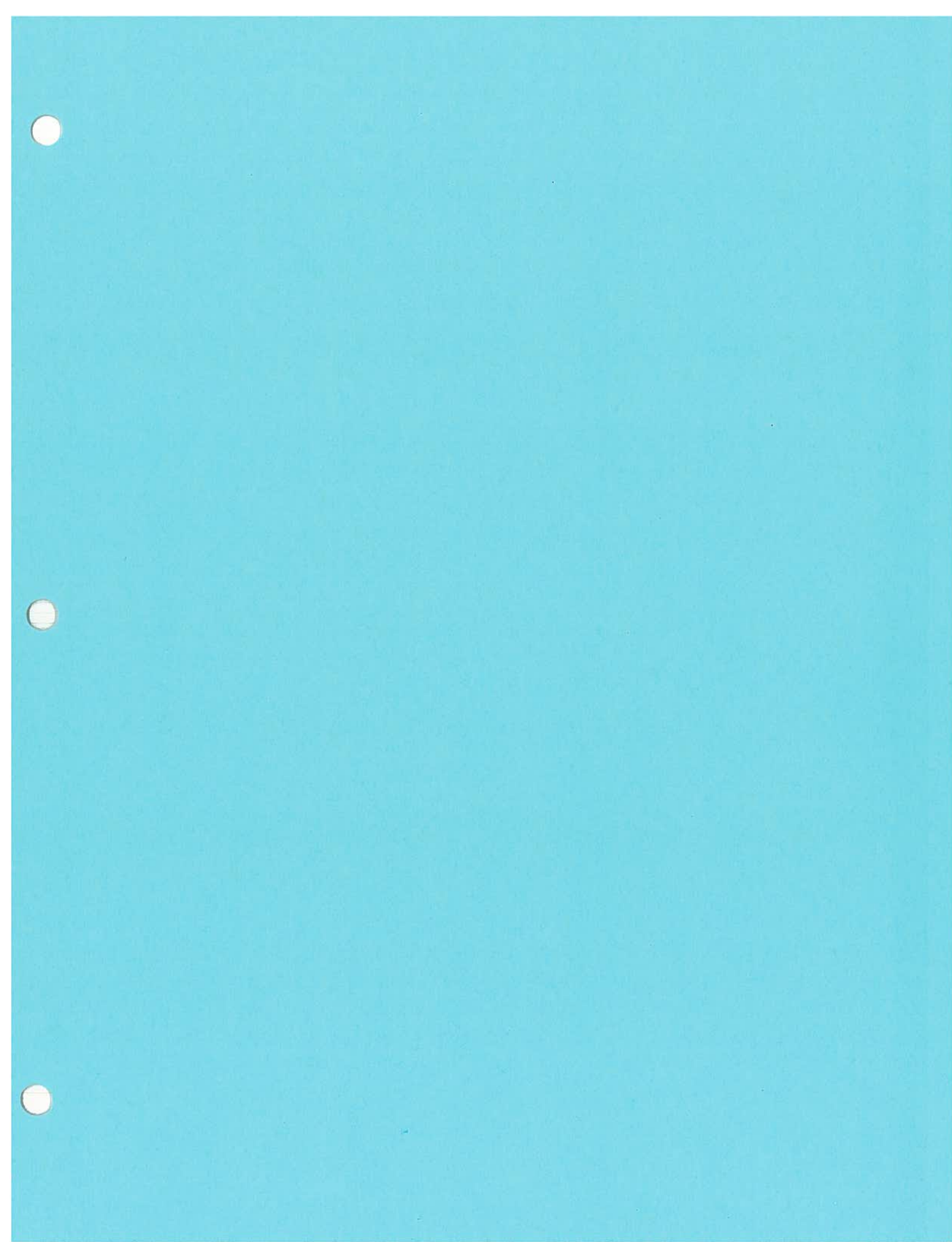
## Work History

- |                  |  |  |
|------------------|--|--|
| • 6/01 – Present | NMED, AQB<br>Santa Fe, NM                        | Manager, NSR Permitting Unit<br>Manager, Technical Services Unit |
| • 6/97 – 5/00    | TLC Printing & Copying, Inc<br>Metairie, LA      | VP Sales & Marketing   |
| • 1/97 – 6/97    | Sabbatical                                       | USA, Europe, Asia  |
| • 5/86 – 1/97    | Planit USA<br>Slidell, LA                        | Owner (sold in 1997)   |
| • 7/84 – 1/97    | CompServCo<br>Slidell, LA                        | Owner  |
| • 1/82 – 7/84    | Dixie Manufacturing, Inc.<br>Harvey, LA          | General Manager  |
| • 2/79 – 1/82    | Martin Marietta Aerospace, Corp.<br>Metairie, LA | Facilities Design Engineer<br>(Space Shuttle Exterior Tank)      |
| • 8/77 – 1/79    | LSU at New Orleans<br>New Orleans, LA            | Student, engineering   |
| • 2/74 – 7/77    | Abraxas Jewelry Manufacturing<br>New Orleans, LA | Owner  |

<b>Education, Certifications:</b>	Professional Engineer, Louisiana LSU, New Orleans University of Texas at El Paso	Mechanical Engineering BS. Mechanical Engineering BS. Math, Physics
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**Interests:** Gardening, reading, jewelry making (certified gemologist), writing, sailing, and hiking.







**STATE OF NEW MEXICO  
BEFORE THE ENVIRONMENTAL IMPROVEMENT BOARD**

**IN THE MATTER OF PROPOSED REVISIONS  
TO THE STATE IMPLEMENTATION PLAN  
FOR THE SAN JUAN GENERATING STATION  
BEST AVAILABLE RETROFIT TECHNOLOGY  
DETERMINATION**

**No. EIB 13- 02(R)**

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**NMED EXHIBIT 11 – WRITTEN TESTMONY OF  
ELIZABETH BISBEY-KUEHN**

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**Statement of Witness Qualifications**

Elizabeth Bisbey-Kuehn is currently the Acting Technical Services Manager for the Air Quality Bureau of the New Mexico Environment Department (NMED). She has served in the Bureau since February of 2005 as a Permit Specialist – a role she continues to perform in addition to her managerial responsibilities. She also served as Acting Minor Source Section Manager from May through October of 2012. Ms. Bisbey-Kuehn holds a Bachelor of Science degree in Environmental Studies from the University of Iowa. Her resume is attached as Exhibit 11a.

**Testimony**

**Background**

1           The visibility provisions of the Clean Air Act (CAA) include a requirement that States  
2 determine the Best Available Retrofit Technology (BART) for certain large stationary sources,  
3 and require those sources to install and operate such technology as expeditiously as possible.

4           BART-eligible sources are those sources which (1) have the potential to emit 250 tons  
5 per year or more of a visibility impairing air pollutant; (2) were put in place between August 7,  
6 1962 and August 7, 1977; and (3) whose operations fall within one or more of 26 specifically  
7 listed source categories.

1 For fossil-fueled generating power plants having a total generating capacity in excess of  
2 750 megawatts (MW), the Act requires that States determine BART pursuant to guidelines  
3 developed by the Environmental Protection Agency (EPA). CAA § 169A(b)(2). EPA  
4 promulgated such guidelines in 2005, and they are codified at Appendix Y to 40 CFR Part 51.  
5 As described in more detail below, Appendix Y sets forth a 5-step procedure for considering the  
6 factors required by the CAA when making BART determinations.

7 In addition to providing guidance for BART determinations for greater-than-750 MW  
8 power plants, the BART guidelines at Appendix Y also provide guidance on how to determine  
9 which sources in a state are BART-eligible, and which of those sources are subject to BART  
10 requirements based on their visibility impacts.

11 Appendix D to New Mexico's 2011 regional haze State Implementation Plan (SIP),  
12 submitted pursuant to 40 CFR § 51.309(g), described New Mexico's findings and determinations  
13 with respect to BART, which were made in accordance with Appendix Y. Specifically,  
14 Appendix D contained a description of the process by which NMED analyzed the BART eligible  
15 sources within the State and determined that only one such source, the San Juan Generating  
16 Station (San Juan or SJGS), is subject to BART requirements. Appendix D also contained the  
17 BART determinations for San Juan for particulate matter (PM) and nitrogen oxides (NOx).  
18 (New Mexico's BART obligations with respect to sulfur dioxide (SO<sub>2</sub>) were satisfied by  
19 implementation of a voluntary backstop SO<sub>2</sub> trading program pursuant to 40 CFR 51.309(d)(4).)

20 In this 2013 proposed SIP revision, Appendix D has been revised to include within the  
21 BART analysis for San Juan a new scenario (the "State Alternative") involving the voluntary  
22 shutdown of two of San Juan's four units. This scenario, which was the result of negotiations

1 between NMED, Public Service Company of New Mexico (PNM), and EPA, is a new alternative  
2 not previously considered by the Department.

3 Much of Appendix D as revised remains unchanged from the 2011 determination. The  
4 sections that remain unchanged include the determination of sources eligible and subject to  
5 BART; the description of the SJGS; the background of the BART regulation; the history of  
6 submissions made by PNM in response to NMED requests, with the exception of an addition of a  
7 2013 update; the 5-step analysis and BART determination for PM; and the conclusion of the 5-  
8 step analysis for NO<sub>x</sub> as of 2011.

9 The 5-step analysis for NO<sub>x</sub> has been revised to include consideration of PNM's revised  
10 BART analysis in accordance with the State Alternative. This analysis included an updated cost  
11 estimate for installing selective non-catalytic reduction (SNCR) on Units 1 and 4 and installing  
12 selective catalytic reduction (SCR) on Units 1 through 4. The cost estimates were based on  
13 vendor quotes and represent the most current cost analyses by air pollution control equipment  
14 vendors and engineering firms. The analysis also included updated emissions reduction  
15 information that would result from the shutdown of Units 2 and 3, and the continued operation of  
16 Units 1 and 4, and new visibility modeling to demonstrate the visibility improvements achieved  
17 by the new scenario.

#### 18 **Determination of Sources "Eligible" for and Subject to BART**

19 Certain large stationary sources that are on a list of defined source categories in the CAA,  
20 which were not in operation prior to August 7, 1962, and were in existence on August 7, 1977,  
21 and that have the potential to emit over 250 tons per year of a defined visibility impairing  
22 pollutant are considered to be a BART eligible source. Visibility impairing pollutants include,  
23 but are not limited to, NO<sub>x</sub>, SO<sub>2</sub>, and PM.

1 In 2006, the Department reviewed all sources for BART eligibility using the criteria  
2 required in Appendix Y. The Department first developed a list of all sources operating in New  
3 Mexico under the Department's regulatory jurisdiction. We then screened the list for only those  
4 sources that are on the defined list of source categories in the CAA. We then reviewed the  
5 startup date and status of operation of the remaining sources. Finally, the Department reviewed  
6 the potential to emit for those remaining sources that have the potential to emit over 250 tons per  
7 year of any visibility impairing pollutant. New Mexico identified 11 sources as BART-eligible  
8 sources as part of this review.

9 Once the Department determined which sources were BART eligible, the Department  
10 needed to determine which sources were subject to the BART rule requirements. The BART  
11 rule allows States to either make BART determinations for all BART-eligible sources or  
12 consider exempting some sources because they may not be reasonably anticipated to cause or  
13 contribute to visibility impairment at any nearby Class I area.

14 The Department determined that it would perform an initial examination to identify  
15 which BART-eligible sources cause or contribute to visibility impairment at subject Class I  
16 areas. The guidelines direct that States that choose this option need only perform a full BART  
17 analysis for those sources shown to cause or contribute to visibility impairment at any of the  
18 subject Class I areas.

19 The first step to determine which sources cause or contribute to visibility impairment is to  
20 establish a threshold in deciviews to measure the impact of a source's operation. A deciview  
21 (dv) is a measurement of visibility impairment. A single source that shows greater than 1 dv  
22 impact is considered to cause visibility impairment and a source that shows less than 1 dv impact  
23 may contribute to visibility impairment. States need to evaluate how many BART-eligible

1 sources impact any of the subject Class I areas to determine an appropriate threshold. If there are  
2 multiple sources impacting Class I areas, States may choose to establish a threshold less than or  
3 equal to 0.5 dv. The rule states that the threshold to determine if a source contributes to visibility  
4 impairment should not be larger than 0.5 dv. The Department reviewed the number of BART-  
5 eligible sources and the sources' proximity to subject Class I areas. The Department concluded  
6 that the BART eligible sources in the State were not concentrated in one region, and therefore  
7 were not concentrating impacts at any one of the subject Class I areas. Based on this review, the  
8 Department established a 0.5 dv threshold for determining whether a BART-eligible source  
9 contributed to visibility impairment.

10 The next step was performing the visibility modeling of each BART-eligible source's  
11 emissions to determine the level of impact the source had on any subject Class I area. The  
12 Department worked with the Western Regional Air Partnership (WRAP) to perform the initial  
13 BART modeling for the state of New Mexico. The WRAP modeled NO<sub>x</sub>, SO<sub>2</sub> and PM  
14 emissions for the 11 BART eligible facilities using the CALPUFF model. Of the 11 source  
15 complexes analyzed, only one source's visibility impact at any subject Class I area due to  
16 combined SO<sub>2</sub>, NO<sub>x</sub>, and PM emissions exceeded the 0.5 dv threshold. This source was PNM  
17 San Juan Generating Station, Boilers #1-4 ("SJGS"). The applicable Class I areas that were  
18 evaluated in the BART process for SJGS are located within 300 km of the SJGS; there are 16  
19 Class I areas that meet this criteria.

20 On November 9, 2006, the Department informed PNM that the modeling performed by  
21 the WRAP indicated the visibility impairment from the SJGS was over the 0.5 dv threshold, and  
22 SJGS was therefore subject to a BART analysis. In response, Black & Veatch (B&V), on behalf  
23 of PNM, submitted the BART modeling protocol to the Department for review.

1 The modeling protocol describes the CALPUFF modeling methodologies and procedures  
2 for the visibility impact assessment that will be performed for the BART analysis. The protocol  
3 contains all the meteorological and terrain data that will be used as well as the source specific  
4 data for the SJGS. The protocol outlines where the receptors will be located at the subject Class  
5 I areas to determine visibility impacts. The protocol was reviewed and the Department found  
6 one area of concern regarding the use of average visibility improvement. PNM updated its  
7 analysis and the Department determined that the protocol was approvable.

## 8 **BART determination for PNM**

### 9 **Source Description**

10 The SJGS consists of four coal-fired generating units and associated support facilities.  
11 Each coal-fired unit burns pulverized coal and No. 2 diesel oil (for startup) in a boiler and  
12 produces high-pressure steam, which powers a steam turbine coupled with an electric generator.  
13 Electric power produced by the units is supplied to the electric power grid for sale. Coal for the  
14 units is supplied by the adjacent San Juan Mine and is delivered to the facility by conveyor.

15 The SJGS Boiler Units 1 and 2 have a unit capacity of 350 and 360 MW, respectively.  
16 Units 3 and 4 each have a unit capacity of 544 MW.

### 17 **Five-Factor Analysis**

18 The NOx and PM BART determinations for San Juan were performed in accordance with  
19 the 5-Step Process set forth in Appendix Y. In brief, the process is as follows:

- 20 Step 1 – Identify All Available Retrofit Control Technologies
- 21 Step 2 – Eliminate Technically Infeasible Options
- 22 Step 3 – Evaluate Control Effectiveness of Remaining Control Technologies
- 23 Step 4 – Evaluate Impacts and Document the Results
  - 24 a) Costs of Compliance
  - 25 b) Energy Impacts
  - 26 c) Non-air environmental impacts
  - 27 d) Remaining useful life



1 Step 5 – Evaluate Visibility Impacts

2  
3 The NOx and PM BART determinations for San Juan involved numerous requests and  
4 responses for more information from PNM, over a period of years (from June of 2006 through  
5 May of 2013). Below is a description of how each step in the 5-step process was satisfied.

6 Step 1 – Identify All Available Retrofit Control Technologies

7 The main strategies for reducing NOx emissions take two forms: 1) modification to the  
8 combustion process to control fuel and air mixing and reduce flame temperatures, and 2) post-  
9 combustion treatment of the flue gas to remove NOx. Particulate matter emissions can only be  
10 controlled by post-combustion control technologies.

11 In the original BART submittal, PNM identified fourteen separate available retrofit NOx  
12 control technologies and four separate available retrofit PM control technologies that have  
13 potential application at the SJGS. The Department reviewed the list of NOx control technologies  
14 and did not identify any additional alternative technologies that should have been considered in  
15 the analysis. The Department reviewed the PM control technologies and requested that PNM  
16 consider wet electrostatic precipitator (WESP) in Step 1 of the BART analysis. PNM  
17 subsequently submitted a complete five-factor analysis for this technology in a submittal dated  
18 August 29, 2008.

19 Please refer to Appendix D and the exhibits for the list of identified available retrofit  
20 control technologies and a description of how each of the controls operates.

21 Step 2 – Eliminate Technically Infeasible Options

22 Step 2 of the 5-step process eliminates technology that is considered technically  
23 infeasible. The basis for technical infeasibility is defined in the regulation and may be due to  
24 limited application at sources similar to the BART-subject source or to technology that is

1 commercially unavailable. Other considerations for technical infeasibility include limitations  
2 due to source-specific design factors.

3 PNM initially proposed elimination of SNCR, rotating opposed fire air (ROFA), and  
4 Rotamix technology because the control technology would not achieve the presumptive NOx  
5 emission limits prescribed in the BART rule. The Department did not agree that SNCR, ROFA,  
6 or Rotamix should have been determined to be technically infeasible NOx control technology  
7 and so requested PNM to perform a full five-factor analysis for these technologies.

8 PNM submitted an updated Final SNCR analysis to the Department on May 30, 2008 and  
9 a Final ROFA-Rotamix analysis on August 29, 2008. PNM also submitted an updated SNCR  
10 analysis on February 9, 2011 and an update to the analysis on February 11, 2011. This submittal  
11 described and included new information on the lowest achievable emission rate for this  
12 technology, and included a ratepayer impact analysis.

13 The Department did agree that six types of NOx control technology should be considered  
14 technically infeasible and agreed that those technologies should not be considered in the  
15 remaining five-factor analysis. Five of these technologies have limited or no application at  
16 sources similar to the SJGS and the sixth, natural gas reburn, is infeasible due to limited boiler  
17 space and resulting insufficient residence time in the natural gas reburn zone.

18 PNM eliminated all additional PM retrofit technologies because either the controls would  
19 not achieve better emissions reduction than the pulse jet fabric filters (PJFF) that were currently  
20 installed at the SJGS, or there was limited application of the technology. The Department  
21 determined that two of the remaining PM control technologies should be considered in the five-  
22 factor analysis and requested PNM to include the WESP technology and an enhanced PJFF

1 installation in an updated submittal. An updated analysis of the two PM control technologies  
2 was submitted on August 29, 2008.

3 Step 3 – Evaluate Control Effectiveness of Remaining Control Technologies

4 Step 3 of the BART analysis includes a control effectiveness evaluation of the remaining  
5 NOx and PM control technologies. PNM contracted with B&V and Sargent & Lundy (S&L) to  
6 determine the control effectiveness of each remaining available NOx and PM control technology  
7 for Units 1-4.

8 The original analysis included only SCR and SNCR/SCR Hybrid NOx control  
9 technology in Step 3. The control effectiveness evaluation for the remaining NOx and PM  
10 technologies were submitted as updates to the Department in separate submittals.

11 The control effectiveness analyses of SNCR, ROFA, and Rotamix was included in the  
12 Final SNCR and Final Nalco-Mobotec analyses submitted May 30 and August 29, 2008. The  
13 control effectiveness analyses of PJFF and WESP technology was submitted August 29, 2008.

14 PNM submitted in 2011 another updated control effectiveness analysis for SNCR based  
15 on a new manufacturer guaranteed emission rate of 0.23 lb/MMbtu.

16 The control effectiveness of the PM and NOx control technologies considered are  
17 presented in Appendix D, Tables 2-9.

18 Step 4 – Evaluate Impacts and Document the Results

19 The Guidelines require States to consider four types of impact analysis in Step 4 of the  
20 BART analysis. These four types of impacts consider the costs of compliance, energy impacts,  
21 non-air quality environmental impacts, and remaining useful life of the facility. These impacts  
22 are included in the cost-effectiveness of each additional control technology and allow

1 comparisons to be made between the remaining controls. B&V performed an impact analysis for  
2 the remaining NOx and PM control technologies in accordance with the Guidelines.

3 B&V and S&L prepared the design parameters and developed estimates of capital and  
4 annual costs for the application of SCR, SNCR, SCR/SNCR Hybrid, ROFA, Rotamix,  
5 ROFA/Rotamix, PJFF, and WESP technologies. B&V relied on a number of sources to prepare  
6 the design parameters, including information from the Nalco Mobotec equipment vendors, SCR  
7 and SNCR equipment vendors, EPA cost manuals, engineering and performance data, and  
8 B&V's own in-house engineering estimates.

9 PNM evaluated the energy impacts, non-air quality environmental impacts, and  
10 remaining useful life of all additional technically feasible control options for NOx and PM.  
11 Energy impacts from control equipment that consume auxiliary power during operation were  
12 considered for all control options. For SCR, SNCR and SCR/SNCR Hybrid technology, the non-  
13 air quality environmental impacts included the consideration of water usage and waste generated  
14 from each control technology. For WESP technology, PNM considered the auxiliary power  
15 consumption to operate the WESP and fans, and the additional water consumption and waste  
16 water disposal requirements from operating the WESP. Lastly, the remaining useful life was  
17 defined as 20 years, except for the 2013 analysis for 4 SCR, 4 SNCR and 2 SNCR/2 Shutdown,  
18 which used a remaining useful life of 30 years. Therefore, no additional cost adjustments for a  
19 short remaining useful boiler life need to be considered.

20 The original submittal contained an impact analysis for only the SCR and SNCR/SCR  
21 Hybrid technologies. The impact analyses for all remaining technologies were submitted as  
22 separate updates to the Department.

1 In the original submittal, the cost estimates for SCR and the SNCR/SCR Hybrid  
2 technology were based on engineering estimates prepared by B&V, without a detailed  
3 explanation of the line items submitted in the estimate. PNM responded to a request for  
4 additional information on July 11, 2007, with updated cost estimates for both SCR and the  
5 SNCR/SCR Hybrid technology. The update included additional details on the basis of  
6 assumptions in the cost estimate.

7 On September 14, 2007 PNM submitted additional information to the Department in  
8 response to a National Park Service letter dated August 16, 2007 and a U.S. Forest Service letter  
9 dated August 23, 2007. In this update, PNM provided additional explanation of the cost estimate  
10 development, and of the \$/ton metric.

11 In a letter dated December 21, 2007, the Department requested PNM perform an updated  
12 cost analysis for SCR based on the EPA's Control Cost Manual. The Department requested this  
13 information because we did not find that PNM provided fully sufficient justification for using  
14 engineering-based cost estimates in lieu of the Control Cost Manual, which is the recommended  
15 methodology to use when possible.

16 PNM responded with the Discussion of OAQPS Control Cost Manual submitted March  
17 29, 2008. In their response, PNM discussed why the Control Cost Manual is not a sufficient  
18 methodology for estimating the costs of air quality control equipment, provided a scope of items  
19 that are missing from the manual for SCR, and provided a comparison between the estimated  
20 costs based on the manual and the B&V estimate used in PNM's cost analysis.

21 In a letter dated April 25, 2008, the Department requested PNM prepare and submit a full  
22 five-factor analysis for ROFA, Rotamix, and SNCR technology. The Department received the  
23 full five-factor analysis for SNCR technology on May 30, 2008, and the full 5 factor analysis for

1 ROFA and Rotamix technology on August 28, 2008. Both of these updates contained an  
2 updated engineering and impact analysis.

3 On December 29, 2009, the Department requested additional information regarding acid  
4 mist emissions from PNM. Acid mist emissions result from the conversion of  $\text{SO}_2$  to  $\text{SO}_3$  across  
5 the SCR catalyst. The Department requested that PNM consider the inherent removal of  $\text{SO}_3$   
6 generated from SCR technology. The inherent removal is based on the existing air pollution  
7 control devices and other process equipment. In addition, the Department requested PNM to  
8 consider the combined effect of  $\text{SO}_3$  removal from existing technologies and with the installation  
9 of sorbent injection control technology. Sorbent injection removes  $\text{SO}_3$  in the flue gas by  
10 reaction of the  $\text{SO}_3$  with an alkaline sorbent material to form a particulate that can be removed by  
11 the PM control device.

12 PNM submitted the requested update on March 16, 2009. This analysis considered  $\text{SO}_3$   
13 emissions removal both from existing equipment and sorbent injection technology, as requested  
14 by the Department. The analysis quantified the  $\text{SO}_3$  emissions and calculated the cost of the  
15 sorbent injection system and included these costs into the cost estimates of the SCR and  
16 SNCR/SCR Hybrid technology.

17 On February 9, 2011, PNM submitted an updated engineering and impacts analysis based  
18 on new information related to SNCR technology. The submittal included new cost estimates  
19 based on 2010 dollars and a new manufacturer guaranteed  $\text{NO}_x$  emission rate of 0.23 lb/MMbtu.  
20 This slightly lower emission rate was a result of better emission control effectiveness for the  
21 technology. The submittal also included an updated impact analysis and cost effectiveness  
22 estimates for SCR, SNCR/SCR Hybrid, ROFA/Rotamix, Rotamix (SNCR), SNCR (Fuel Tech)  
23 and ROFA.

1 On February 11, 2011, PNM submitted an additional update that replaced the February 9,  
2 2011 submittal. This new update included a unit-specific level of information with respect to  
3 visibility and cost effectiveness. PNM also submitted information regarding the updated rate  
4 impact costs for SNCR and SCR plus sorbent injection to PNM customers based on PNM's  
5 ownership share of 46.3% of SJGS.

6 On April 1, 2013, PNM submitted an updated impacts analysis based on new information  
7 related to a voluntary shutdown of two units (Units 2 and 3). This update considers the impacts  
8 analysis from three specific control scenarios at the SJGS; the installation of SCR on all four  
9 units, the installation of SNCR on all four units, and the installation of SNCR on Units 1 and 4  
10 and shutdown on Units 2 and 3.

11 For the 2013 submittal, PNM contracted with (S&L) to develop a conceptual design,  
12 project cost estimate, and technical portions of an Engineering, Procurement and Construction  
13 specification for SCR control systems on SJGS Units 1-4. Site specific factors that had a  
14 significant effect on the SCR design basis and costs include the site congestion at SJGS, NOx  
15 emission reduction requirements, balanced draft conversion and the inclusion of a sorbent  
16 injection system to meet sulfuric acid mist emission limits.

17 In the analysis S&L updated the cost analysis to reflect the approach described in the  
18 EPA's Control Cost Manual. The NMED reviewed the cost analysis based on the methodology  
19 in the Control Cost Manual and finds that the cost estimation methodology is acceptable to the  
20 Department. The cost estimates in the report provide an overview of the approach, the design  
21 parameters, and the basis for the assumptions used to develop the costs estimates. The Control  
22 Cost Manual does not allow the consideration of a number of specific types of cost, including

owner's costs and Allowance for Funds Used During Construction (AFUDC), and these costs were specifically excluded from the cost estimates prepared by S&L.

Lower cost estimates for SCR installation have been provided for a four unit SCR installation by the National Park Service (NPS). The Department does not necessarily agree with the methodology of the NPS cost analysis. Nonetheless, the Department reviewed those estimates and finds that this information would not impact the Department's final recommendation for BART at the SJGS. For example, the NPS estimates submitted to the Department indicate the total capital investment for SCR technology would be around \$374,152,055 for a four unit installation. However, the total capital investment estimated for the 2 SNCR/2 Unit shutdown scenario is only \$34,556,000, making this proposal the most cost effective proposal, especially considering the emissions reduction and visibility improvement that would be achieved by this proposed alternative.

#### Step 5 – Evaluate Visibility Impacts

The Guidelines require States to assess visibility improvement based on the modeled change in visibility impacts for the pre-control and post-control emission scenarios. This is Step 5 of the 5-factor BART analysis. As noted previously, visibility impacts were reviewed for 16 Class I areas located within 300 km of the SJGS. There were multiple updates to the original visibility modeling analysis that was submitted to the Department.

The first visibility analysis of additional control technology was submitted in the original BART submittal. In the original submittal, only SCR and SCR/SNCR Hybrid technology was reviewed as technically feasible additional control technology. The analysis was based on a constant ammonia background concentration and nitrate repartitioning. Because PNM had recently installed low NOx burners and overfire air (OFA) technology at the SJGS as the result



1 of a consent decree, the analysis also considered the pre-consent decree and post-consent decree  
2 emissions to determine the visibility improvement achieved by the technology retrofit.

3 In an email dated June 30, 2007, the NMED requested that PNM update their \$/deciview  
4 impact analysis to be based on the maximum visibility improvement, and not on average  
5 visibility improvement as had been originally submitted. On August 23, 2007, PNM submitted  
6 the updated visibility cost-effectiveness data to the Department.

7 On November 5, 2007, PNM submitted an additional refined BART modeling report to  
8 the Department. PNM had investigated nitrate repartitioning and ammonia background  
9 concentration refinements in the air dispersion modeling analysis and determined these  
10 refinements more accurately predicted visibility modeling results. Nitrate repartitioning  
11 eliminates impacts from overlapping puffs and the background ammonia concentration was  
12 modified to assume monthly variable concentrations instead of a continuous 1 ppb background  
13 amount.

14 In a letter dated December 21, 2007, the NMED requested additional modeling analyses  
15 to determine plant-wide and individual unit specific visibility impact analysis. PNM submitted  
16 the updated analysis on March 31, 2008. The report considered both plant-wide and individual  
17 unit specific impacts as well as both the refined and unrefined ammonia background and nitrate  
18 repartitioning analysis.

19 On May 30, 2008, PNM submitted an additional modeling analysis to include SNCR  
20 technology, which the NMED had determined should have been reviewed in the full 5-factor  
21 analysis. As in the March 31, 2008 update, PNM submitted two reports, one including the  
22 constant ammonia background with nitrate repartitioning and the other report with variable  
23 ammonia background with the new nitrate repartitioning methodology.

1 On August 29, 2008, PNM submitted an additional visibility modeling analysis to include  
2 Nalco Mobotec NOx control technologies. Specifically, the NMED requested modeling of  
3 ROFA with Rotamix, Rotamix, and ROFA control technologies. Rotamix and ROFA are a  
4 variant of SNCR and overfire technologies, respectively, and the NMED determined these  
5 technologies should have been evaluated in the full 5-factor analysis. This report also contained  
6 an update of the discussion of PM control technologies. A full visibility impact analysis of  
7 WESP technology was submitted as part of this updated report.

8 On December 29, 2008, the NMED requested additional information regarding the acid  
9 mist emissions from the SJGS and how these emissions impact the modeling analysis. To  
10 comply with the NMED's request, PNM submitted an updated modeling analysis on March 16,  
11 2009, that included consideration of the inherent removal of SO<sub>3</sub> emissions from existing control  
12 technologies and consideration of the installation of a sorbent injection system control  
13 technology that would control acid gas emissions.

14 On February 9 and 11, 2011, PNM submitted a full new 5-factor analysis of SNCR  
15 technology after PNM received a lower vendor guaranteed emission rate from an equipment  
16 vendor. For consistency, PNM assumed the monthly variable ammonia concentration and the  
17 nitrate repartitioning methodology based on the November 6, 2007 modeling refinements.

18 On April 1, 2013, PNM submitted new, updated modeling to reflect the voluntary  
19 shutdown of Units 2 and 3, and a lower federally enforceable SO<sub>2</sub> emission rate of 0.10  
20 lb/MMbtu at the remaining Units 1 and 4. In this modeling analysis, PNM relied on many of the  
21 modeling assumptions used in the EPA's modeling of the Federal Implementation Plan (FIP),  
22 including constant ammonia background concentration, to allow for comparisons to be made  
23 between modeling by both EPA and PNM. The three control technology scenarios modeled

1 were the proposed SIP (SNCR on Units 1-4), the FIP (SCR on Units 1-4) and a new State  
2 Alternative (SNCR on Units 1 and 4, shutdown Units 2 and 3).

3 The updated visibility analysis for the installation of SCR on all four units and SNCR on  
4 all four units incorporated the SO<sub>2</sub> and total particulate matter (TPM) emission rates of 0.15  
5 lb/MMBtu and 0.034 lb/MMBtu, respectively, from the current NSR Permit issued August 31,  
6 2012. The updated visibility analysis for the installation of SNCR on Units 1 and 4 and a two-  
7 unit retirement incorporated the new TPM emission rate of 0.034 lb/MMBtu and an SO<sub>2</sub>  
8 emission rate of 0.10 lb/MMBtu. This new SO<sub>2</sub> emission rate will be incorporated into the  
9 facility's NSR permit as a federally-enforceable permit condition should this scenario be  
10 determined as BART for the source.

#### 11 **Conclusion of analysis (Determination of BART)**

12 In accordance with Section 169A(g)(7) of the CAA, the Department considered the five  
13 statutory factors in the BART analysis for the SJGS: (1) the costs of compliance; (2) energy and  
14 non-air quality environmental impacts of compliance; (3) any existing pollution control  
15 technology in use at the source; (4) the remaining useful life of the source; and (5) the degree of  
16 improvement in visibility which may reasonably be anticipated to result from the use of such  
17 technology.

#### 18 **PM BART Assessment**

19 The Department's BART determination for PM in Appendix D is unchanged from 2011,  
20 and was approved by the EPA in November 2012. 77 FR 64,908 (Nov. 27, 2012).

#### 21 **2011 NO<sub>x</sub> BART Determination**

22 Based on the five-factor analysis, the Department determined in 2011 that, for the facility  
23 comprising Units 1, 2, 3, and 4, BART for NO<sub>x</sub> is SNCR technology at an emission rate of 0.23

1 lb/MMBtu on a 30-day rolling average. The Department's determination of BART was based on  
2 the results of the five-factor analysis.

3 **2013 NOx BART Determination.**

4 The Department analyzed the scenario contained in the non-binding agreement (Term  
5 Sheet) between the EPA, NMED and PNM, signed February 15, 2013 (the "State Alternative"),  
6 and the resulting significant environmental improvements of this alternative. The Department  
7 revised the BART analysis to compare this scenario to the 4 SNCR and 4 SCR scenarios  
8 previously evaluated. The Department's determination of BART was based on consideration of  
9 the BART statutory factors in the context of the elements of the State Alternative (2 SNCR/2  
10 Shutdown).

11 1) PNM will retire Units 2 and 3 by December 31, 2017. These retirements do not  
12 give rise to control equipment costs requiring amortization. The remaining useful life of  
13 the source is defined as 30 years for the three scenarios described (4 SCR, 4 SNCR, 2  
14 SNCR/2 Shutdown). Therefore, the statutory factor of the remaining useful life of the  
15 source does not weigh in favor of any option over another.

16 2) PNM will obtain the necessary construction permit modification to limit the SO<sub>2</sub>  
17 emission rates at Units 1 and 4 to 0.10 lb/MMBtu on a daily rolling 30-day average basis.  
18 These SO<sub>2</sub> emission reductions occur separately and apart from the SO<sub>2</sub> backstop trading  
19 program that EPA has already approved as satisfying BART. In addition to increased  
20 visibility improvement, these SO<sub>2</sub> reductions will lead to non-air quality environmental  
21 benefits, such as decreased acid deposition.

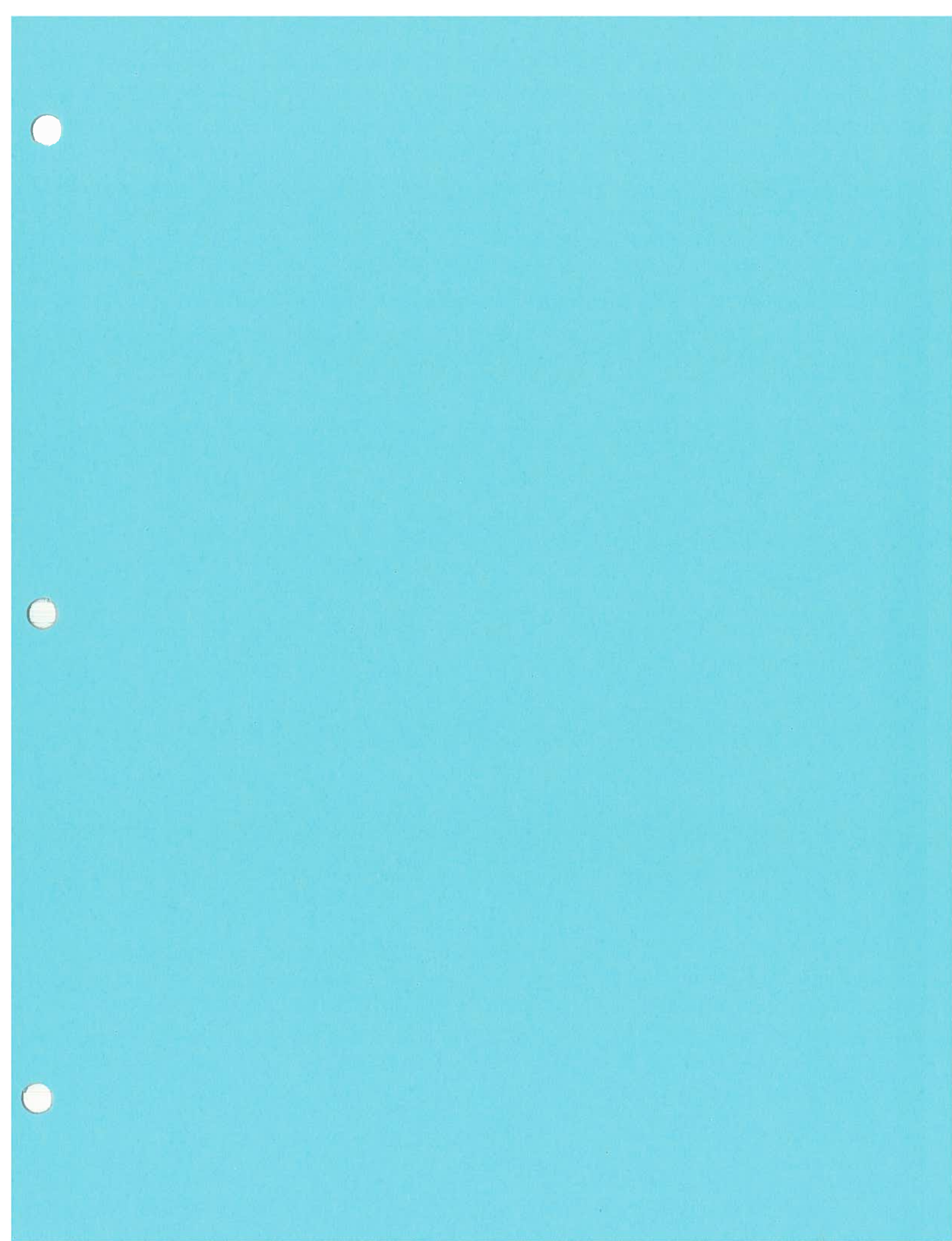
22 3) The retirement of Units 2 and 3 will reduce the facility annual NOx emissions by  
23 an additional 10,550 tons. When added to the controlled emission rate of Units 1 and 4,

1 total annual NOx emission will be reduced by 12,989 tons. Additionally, PNM will  
2 conduct performance testing to determine if the SNCRs installed on Units 1 and 4 can  
3 achieve significantly less than 0.23 lb/MMBtu.

4 4) The 2 SNCR/2 Shutdown scenario would result in less material usage than the 4  
5 SCR and 4 SNCR scenarios. See Table 23 in Appendix D. This will result in less  
6 limestone required to be transported and mined, less diesel fuel that would need to be  
7 refined for this power plant, less coal mining and processing, and less carbon that would  
8 need to be activated. Closure of two units will result in up to 53 percent less water used,  
9 from 21,000 acre-feet to 10,161 acre-feet; wastewater generated will be reduced by up to  
10 50 percent, from 41 million gallons to 21 million gallons; and solid waste generated will  
11 be reduced by up to 50 percent, from 1.71 million tons per year to 854,130 tons per year.

12 Based on this analysis, the Department determined that BART for NOx at the SJGS is the  
13 installation of SNCR technology on Units 1 and 4, with performance testing, coupled with the  
14 retirement of Units 2 and 3, as outlined in the Term Sheet.









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#### **Education**

Attended M.Sc. Program in Soil Science, 08/2003-12/2004  
University of Kentucky, Lexington, KY

B.S. in Environmental Studies  
University of Iowa, Iowa City, IA., conferred May 2002.

#### **Employment Experience**

##### 01/2013 to present

Acting Technical Services Manager, Air Quality Bureau, NMED

##### 05/2012 – 10/2012

Acting Minor Source Section Manager, Air Quality Bureau, NMED

##### 02/28/2005 to present

Permit Specialist, Major Source Permit Section, Air Quality Bureau, NMED

My primary responsibilities involve performing technical analyses of air quality permit applications; drafting permits in accordance with federal and state regulations; accomplishing special projects in support of the section, mentoring new staff, and assisting the regulated community and concerned citizens.

##### 08/2002-05/2003 and 08/2003-12/2004

Teaching and Research Assistant, University of Kentucky, Lexington, KY  
Introduction to Soil Science, Agronomy Department

Teaching Assistant, University of Iowa, Iowa City, IA  
Introduction to Earth Systems Science, Geography Department  
Introduction to Environmental Science, Geoscience Department

#### **Professional Development and Training Courses**

Effective Permit Writing  
Sources and Control of PM Emissions  
Introduction to Hazardous Air Pollutants  
Control of Gaseous Emissions

Permit Practices and Procedures I and II  
NSR Reform and Advanced PSD  
Basic NSR/PSD  
Environmental Negotiations

Volunteer with the Santa Fe Botanical Garden, Johnson County Natural Resources Conservation Service, and Railyard Community Stewards







**STATE OF NEW MEXICO  
BEFORE THE ENVIRONMENTAL IMPROVEMENT BOARD**

**IN THE MATTER OF PROPOSED REVISIONS  
TO THE STATE IMPLEMENTATION PLAN  
FOR THE SAN JUAN GENERATING STATION  
BEST AVAILABLE RETROFIT TECHNOLOGY  
DETERMINATION**

**No. EIB 13- 02(R)**

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**NMED EXHIBIT 12 – WRITTEN TESTMONY OF  
Dr. GI-DONG KIM**

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**Statement of Witness Qualifications**

Gi-Dong Kim is a Modeling Specialist in the Modeling Unit of the Air Quality Bureau's Planning and Policy Section, where he has worked for eleven years. Dr. Kim holds a Ph.D. and a Master of Science Degree in Environmental Engineering from the University of Tennessee. His responsibilities with the Bureau include the review and performance of computer-based dispersion modeling in support of permitting, enforcement and regulation development actions.

Dr. Kim has performed approximately 154 modeling analyses for the Bureau. He was responsible for reviewing the dispersion modeling analysis performed by PNM throughout the BART determination process. His resume is attached as exhibit 12a.

**Testimony**

**Introduction**

- 1 The major steps involved in performing this visibility modeling analysis were to:
- 2           ○ Determine natural visibility conditions as a baseline visibility condition;
- 3           ○ Evaluate the emission rates of the pollutants that deteriorate visibility;
- 4           ○ Run CALMET meteorology model with 2001 year of meteorological data;
- 5           ○ Run CALPUFF model with the emission rates and the output of CALMET model;
- 6           ○ Run CALSUM post-processor;
- 7           ○ Run CALPOST post-processor to perform visibility calculations; and
- 8           ○ Repeat all the procedures using meteorological data for the years 2002 and 2003.
- 9
- 10           Natural visibility (or background) conditions are used as a reference for determination of
- 11 the impact of the facility sources. More specifically, CALPOST, which is a post-processor of the

CALPUFF modeling system, calculates delta deciviews values that are the difference between deciviews including the impact of the facility sources and the natural visibility condition and deciviews of the natural visibility condition alone. From among these daily values for each year modeled, the value of the 98<sup>th</sup> percentile (approximately equivalent to the 8<sup>th</sup> highest value (or day)) is used for comparing the effects of each scenario in improving visibility.

The governing requirements for this analysis are found in 40 C.F.R. Part 51 Appendix Y, EPA BART Guidelines, and the Western Regional Air Partnership (WRAP) BART modeling guidelines developed by a collaborative effort of tribal governments, state governments and various federal agencies to comply with EPA's regional haze regulations.

My role for this project was to make sure that PNM's visibility modeling analysis was consistent with the BART Modeling Guidelines and then evaluate the visibility improvement of each NO<sub>x</sub> control technology, using PNM's visibility modeling results.

### **PNM's Modeling Submissions**

In 2007, PNM provided NMED with all the modeling results performed on a year-to-year basis for the facility-wide impact for each control scenario. PNM modeled visibility impacts of nitrogen oxides (NO<sub>x</sub>), sulfur dioxide (SO<sub>2</sub>), and particulate matter (PM), which are the visibility impairing pollutants emitted by the facility. PNM submitted updated modeling analyses performed with revised emission rates and different ammonia background concentrations several times between 2007 and 2012, using the same 2007 modeling approach. PNM submitted the most updated modeling analysis in 2013.

The 2013 modeling was performed with the revised emission rates for Sulfur Dioxide (SO<sub>2</sub>), Sulfuric Acid (H<sub>2</sub>SO<sub>4</sub>), and Total Particulate Matter (TPM) and available NO<sub>x</sub> control technologies including selective catalytic reduction (SCR), selective non-catalytic reduction

1 (SNCR), and also considering unit retirements as an alternative operating scenario that had not  
2 been discussed previously. More specifically, the 2013 modeling analysis incorporated the new  
3 SO<sub>2</sub> emission rate of 0.15 lb/MMBtu, total particulate matter (TPM) emission rate of 0.034  
4 lb/MMBtu, and H<sub>2</sub>SO<sub>4</sub> emission rates of 0.00026 lb/MMBtu and 0.000046 lb/MMBtu for SCR  
5 and non-SCR, respectively, from the current NSR permit dated August 31, 2012. These new  
6 emission limits have been incorporated into the Baseline modeling scenario and each NO<sub>x</sub>  
7 control scenario, including EPA's Federal Implementation Plan (FIP) scenario representing four  
8 SCRs, and NMED's 2011 State Implementation Plan (SIP) scenario representing four SNCRs.  
9 For the State Alternative representing SNCR on Units 1 and 4, and shutdown of Units 2 and 3,  
10 the modeling is based on these same emission rates for TPM and H<sub>2</sub>SO<sub>4</sub>, while for SO<sub>2</sub> a rate of  
11 0.10 lb/MMBtu is used, as specified in the Term Sheet. The PNM modeling analysis was  
12 performed on a year-by-year basis for the facility-wide impact for the four scenarios.

13 The most significant difference from prior modeling is that the 2013 modeling analysis  
14 considered two unit retirements, with SNCR for the other two units, as an alternative operating  
15 scenario.

16 In terms of methodology, the major difference between the 2007 and 2013 modeling  
17 analyses is that in 2007, PNM used a non-regulatory version of the CALPUFF modeling system  
18 (Version 6.1). In 2013, PNM used a regulatory version of the CALPUFF modeling system,  
19 Version 5.8. Another difference is that in 2007, PNM used a National Park Service methodology  
20 to calculate inorganic condensable particulate matter, H<sub>2</sub>SO<sub>4</sub>. In 2013, PNM used the inorganic  
21 condensable particulate matter emission rates based on the facility's total particulate matter  
22 emission limit as established in the NSR permit effective August 31, 2012, which is more  
23 realistic. An additional difference is that the 2013 modeling analysis was performed with a more

representative ammonia background concentration and an improved method to calculate visibility impacts. The 2013 modeling approach is more conservative than the 2007 modeling approach.

#### **Evaluation of PNM's Modeling**

I determined that the PM modeling was performed according to the WRAP BART modeling guidelines and EPA Guidelines. The PNM BART modeling was performed using an EPA-approved version of the CALPUFF model to account for the chemical transformation of NO<sub>x</sub> and SO<sub>2</sub>, an EPA-compiled meteorological data set, and modified EPA's modeling input files to include the source specific parameters for PNM specific modeling scenarios. The modeled CALPUFF domain, receptors, ozone, and the meteorological data used in the analysis all came directly from EPA modeling.

As previously described, PNM modeled the following scenarios:

Table 1. Target Emissions for Modeling Scenarios

Scenario	Operation and Target Emissions
Baseline	Units 1-4 operating only with existing air pollution control technology and new permitted SO <sub>2</sub> and Total Particulate Matter (TPM) emission rates of 0.15 lb/MMBtu and 0.034 lb/MMBtu, respectively Sulfuric Acid (H <sub>2</sub> SO <sub>4</sub> ) emission rate of 0.000046 lb/MMBtu for non-SCR
EPA FIP	Units 1-4 operating with existing air pollution control technology and with new SCR installation; NO <sub>x</sub> at 0.05 lb/MMBtu and new permitted SO <sub>2</sub> and TPM emission rates of 0.15 lb/MMBtu and 0.034 lb/MMBtu, respectively Sulfuric Acid (H <sub>2</sub> SO <sub>4</sub> ) emission rate of 0.00026 lb/MMBtu for SCR
2011 NMEDSIP	Units 1-4 operating with existing air pollution control technology and with new SNCR installation; NO <sub>x</sub> at 0.23 lb/MMBtu and new permitted SO <sub>2</sub> and TPM emission rates of 0.15 lb/MMBtu and 0.034 lb/MMBtu, respectively Sulfuric Acid (H <sub>2</sub> SO <sub>4</sub> ) emission rate of 0.000046 lb/MMBtu for non-SCR
State Alternative	Units 2 & 3 retired, Units 1 & 4 operating with existing air pollution control technology and with new SNCR installation; NO <sub>x</sub> at 0.23 lb/MMBtu, new permitted TPM emission rate of 0.034 lb/MMBtu, and a



reduced SO <sub>2</sub> emission rate of 0.10 lb/MMBtu Sulfuric Acid (H <sub>2</sub> SO <sub>4</sub> ) emission rate of 0.000046 lb/MMBtu for non-SCR
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1  
2 After determining that PNM's modeling conformed to applicable requirements and  
3 guidelines, I explored the PNM modeling results to estimate the visibility improvement in three  
4 ways recommended by EPA: 98<sup>th</sup> percentile deciview (dv) at each Class I area for the four  
5 scenarios, average and maximum days exceeding the threshold value of 0.5 dv, and deciview  
6 improvement at each Class I area with additional NO<sub>x</sub> control technologies on the existing air  
7 pollution control technology.

8 Figure 1 shows the 98<sup>th</sup> percentile deciview values of each NO<sub>x</sub> control scenario at the 16  
9 Class I areas for comparing the effects of each scenario in improving visibility. Deciviews are  
10 the measure of visibility. More specifically, the higher the deciview value is, the worse the  
11 visibility condition is. As shown in Figure 1, the EPA FIP and State Alternative outperform the  
12 2011 NMED SIP from the comparison of the three years from 2001 through 2003. Mesa Verde  
13 National Park shows the highest 98<sup>th</sup> percentile among the 16 Class I areas, which is the nearest  
14 Class I area to SJGS, located approximately 40 km north of the facility. Grand Canyon National  
15 Park shows the lowest 98<sup>th</sup> percentile, which is located in the most distant area, located  
16 approximately 300 km west of the SJGS.

17 When the frequency of the occurrence of the peak 98<sup>th</sup> percentile is compared to each  
18 BART technology scenario, the figure illustrates that the State Alternative and the EPA FIP more  
19 significantly reduce the peak 98<sup>th</sup> percentiles than the NMED SIP scenario does. Figure 2 shows  
20 the cumulative 98<sup>th</sup> percentile value of the sixteen Class I area for each scenario for the  
21 comparison of a general visibility improvement.

22 Figure 3 shows the days exceeding a 0.5 dv threshold at each Class I area for each BART  
23 technology scenario for each year of the three years. The figure indicates that the State

Alternative and the EPA FIP significantly improve visibility as compared to the Baseline and 2011 NMED SIP scenarios. The State Alternative closely matches the EPA FIP scenario's days comparison.

Figure 4 shows the visibility improvement with additional NOx control technologies on top of the base case. The results indicate that the State Alternative and the EPA FIP are better than visibility impacts projected for the 2011 NMED SIP scenario. The State Alternative is comparable to the EPA FIP in improving visibility.

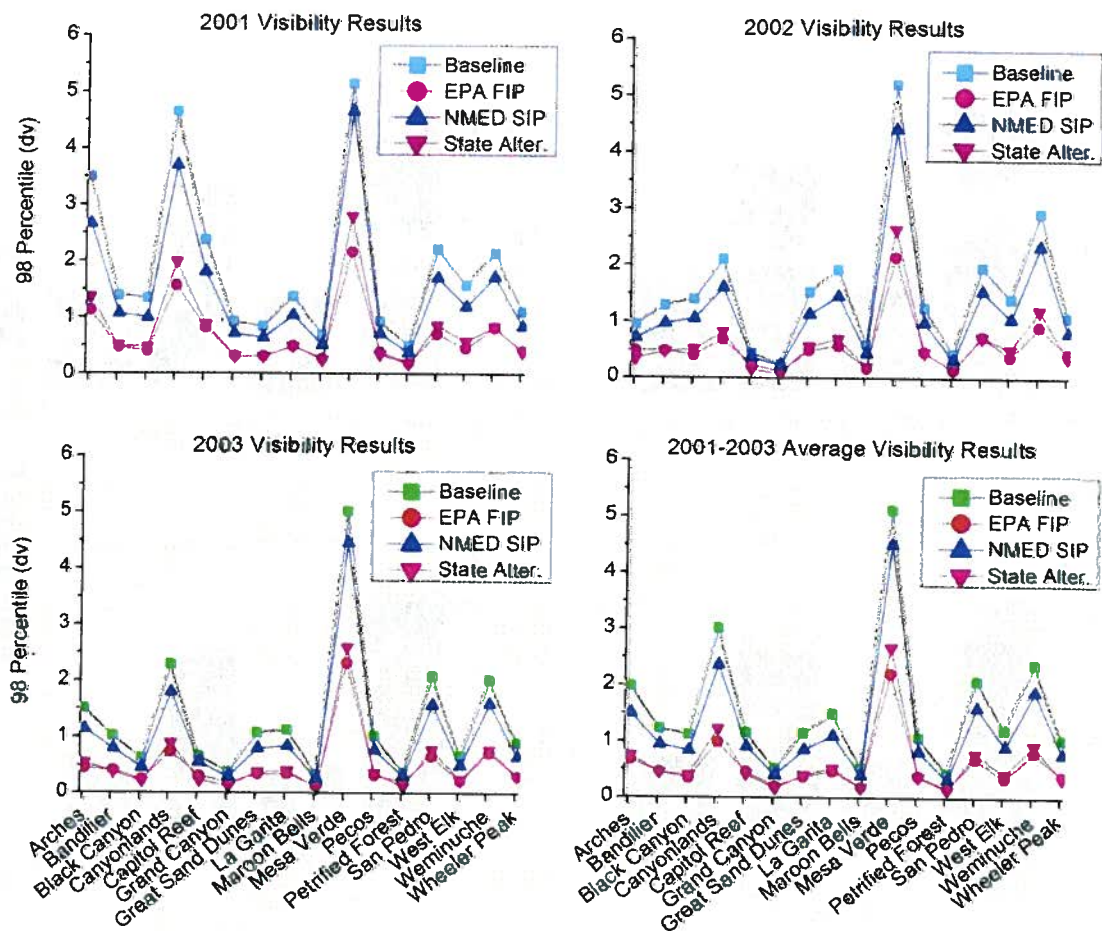


Figure 1. 98<sup>th</sup> Percentile on the 16 Class I areas

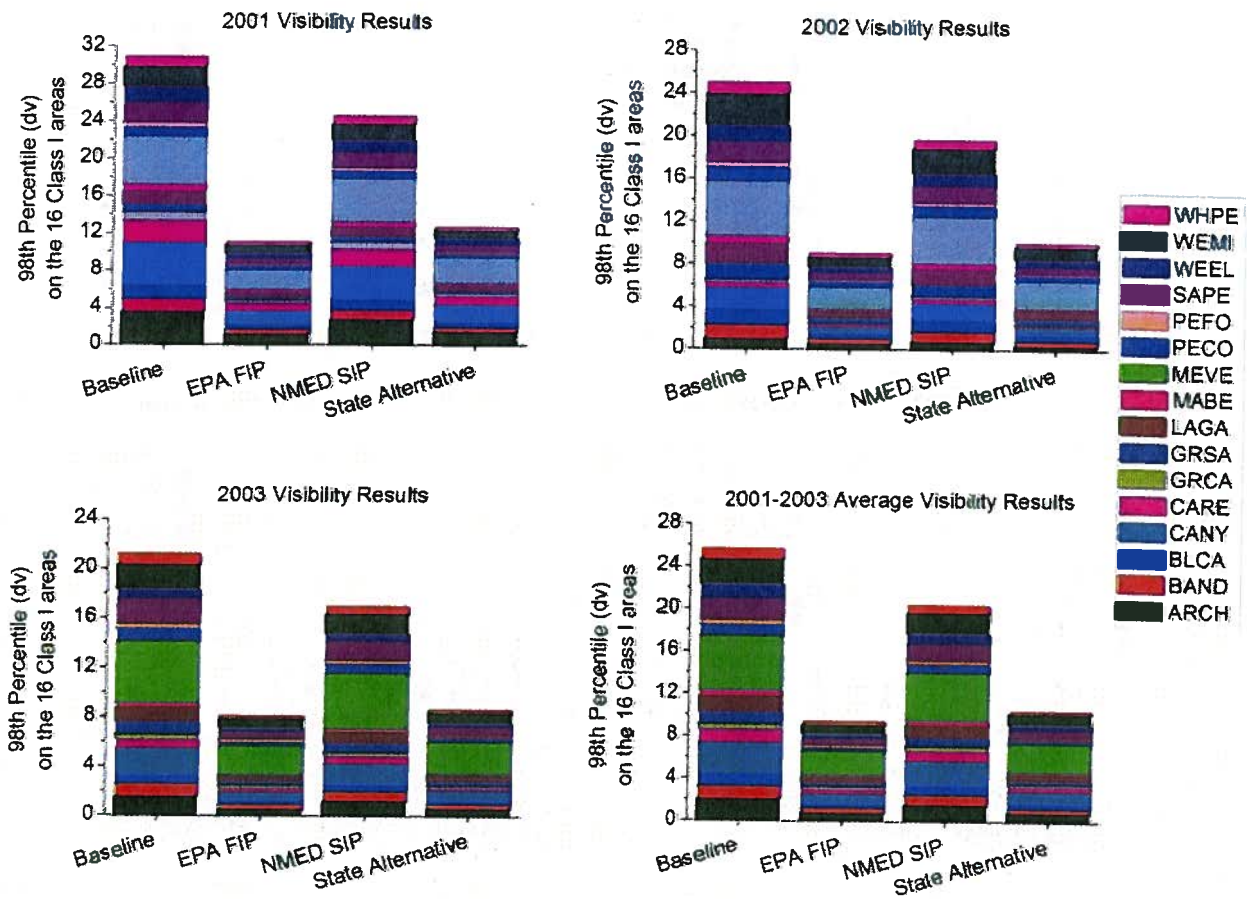


Figure 2. Visibility Impact Results

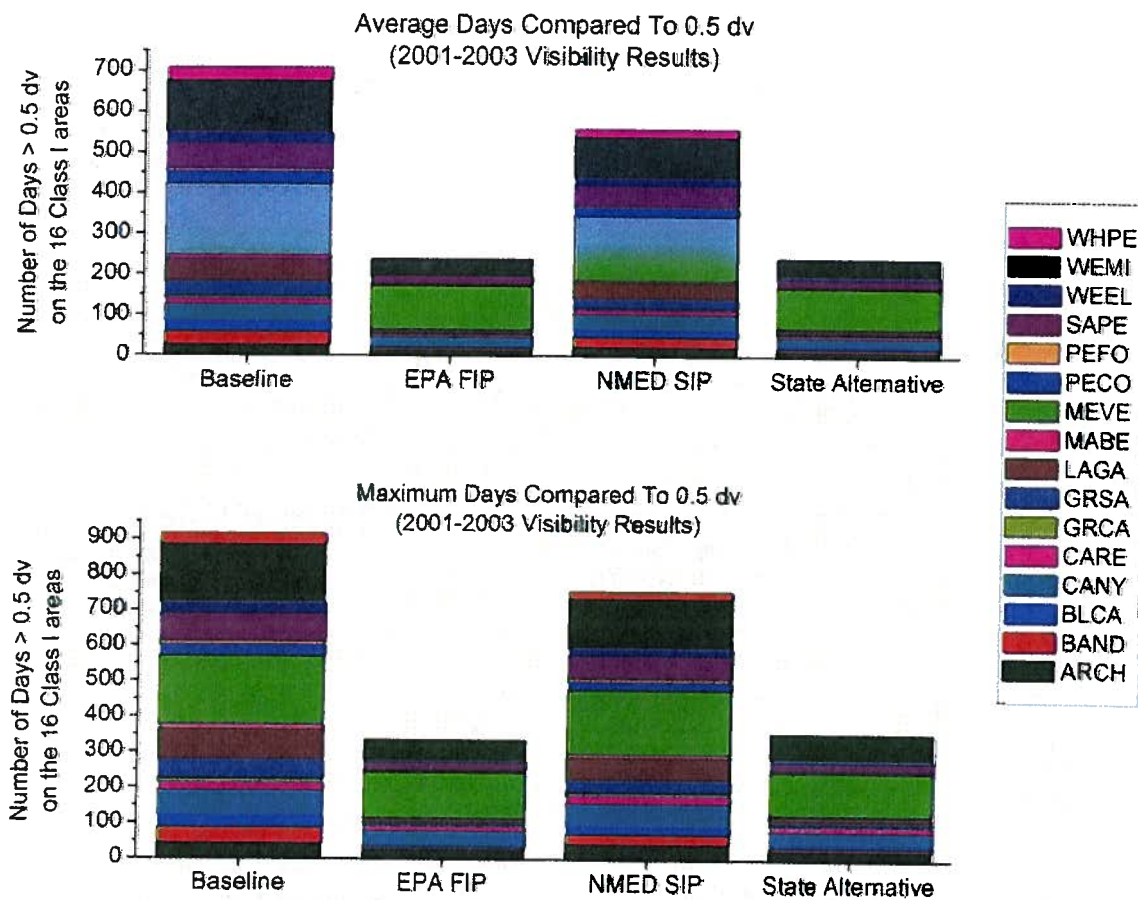


Figure 3. Average and Maximum Days Compared to 0.5 dv

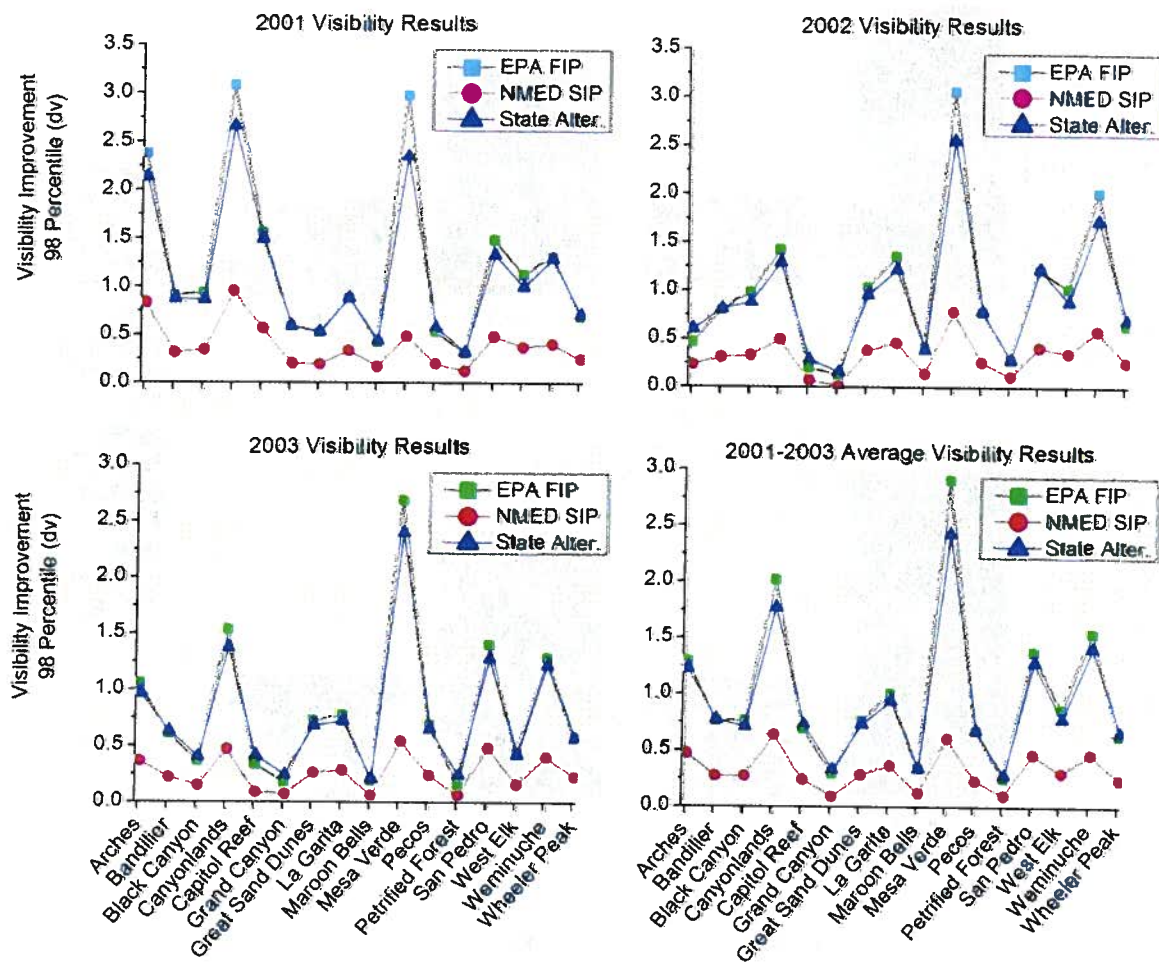
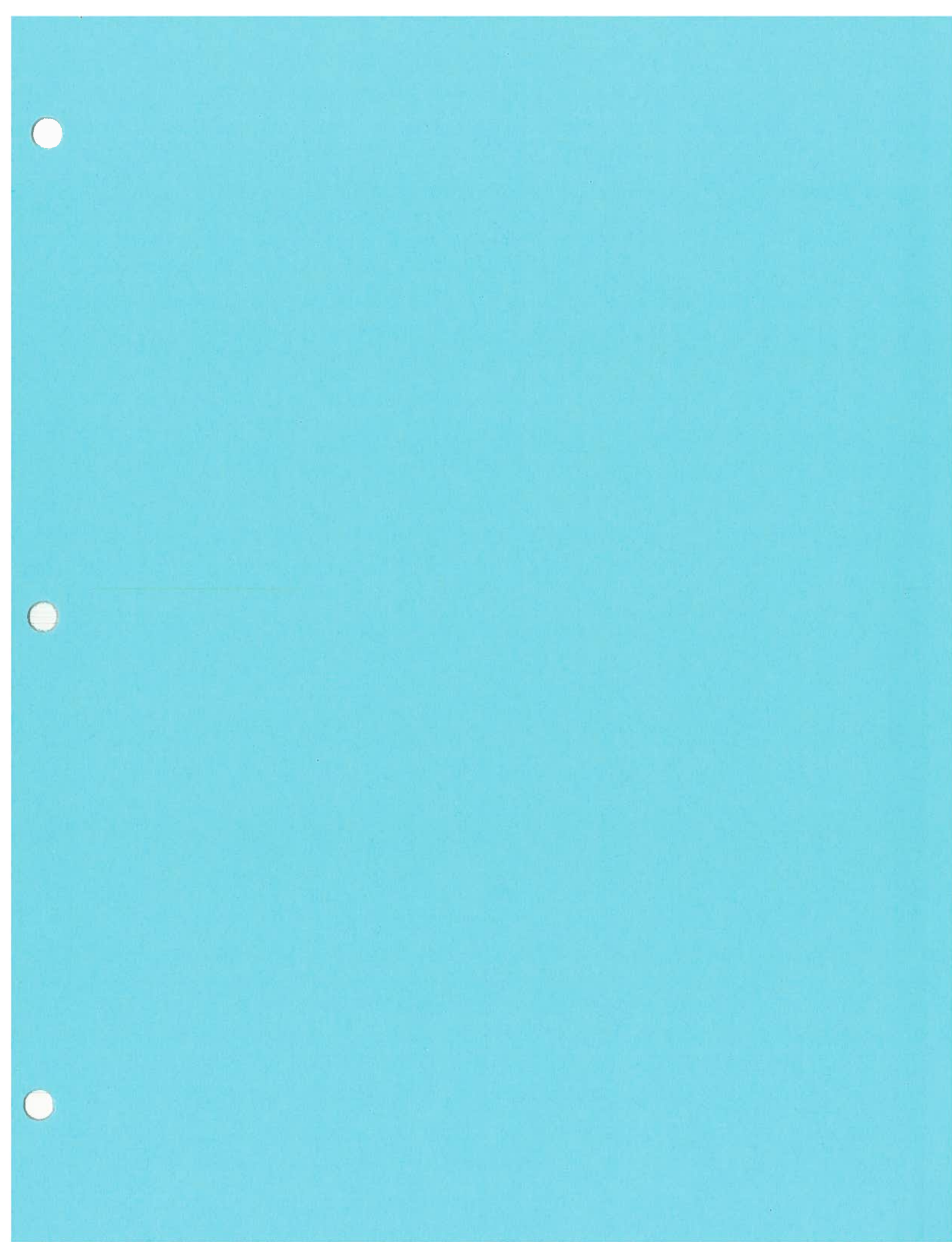


Figure 4. Visibility Improvement of Each Scenario









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### **EDUCATION**

PhD in Environmental Engineering, December 2001  
**The University of Tennessee, Knoxville**

MS in Environmental Engineering, December 1998  
**The University of Tennessee, Knoxville**

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### **PUBLICATIONS AND PRESENTATIONS**

1. Gi-Dong Kim., Wayne T. Davis., Terry L. Miller. (2004) "Prediction of the Vertical Profile of Ozone Based on Ground-Level Ozone Observations and Cloud Cover", Journal of the Air & Waste Management Association v54 April p483-494
2. Wayne T. Davis., Gi-Dong Kim., Teresa C. Perry. (2001) "Study of the Adsorption/Removal Efficiency of Woven and Nonwoven Activated-Carbon Fabrics for MEK", Separation Science and Technology v36 n5-6 p931-940
3. Wayne T. Davis., Gi-Dong Kim. (1999) "Effect of Prefilters on the Performance of HEPA Filters", Filtration & Separation v36 n3 April p51-56
4. Teresa C. Perry., Gi-Dong Kim., Wayne T. Davis. (1999) "Adsorption/Removal Efficiency of Commercially Available Activated Carbon Fabrics and Filters in a Simulated Indoor Environment", Conference Proceedings for the June 1999 Annual Meeting of the Air and Waste Management Association
5. Wayne T. Davis., Gi-Dong Kim. (1998) "Effect of Prefilters on the Performance of HEPA Filters", Conference Proceedings for the June 1998 Annual Meeting of the Air and Waste Management Association

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### **EXPERIENCE**

**Modeling Scientist:** New Mexico Environment Department, Santa Fe (01/2003 – Present)

- To perform and review air quality dispersion modeling with the use of the EPA regulatory models such as ISCST3, AERMOD, and CALPUFF in support of New Source Review and Title V permit applications.
- To provide technical guidance and information to consultants, industry, citizen groups, and Air Quality Bureau staffs.
- To attend pre-application meetings and process requests for model input information such as meteorological data and surrounding source emission inventories.

**Post-doctoral Research Associate:** The University of Tennessee, Knoxville (01/2002 – 12/2002)

- Developed Criteria Pollutant (PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, NO<sub>x</sub>, CO, and Pb) Emissions Inventory Database for the State of Tennessee.

**Graduate Research Assistant:** The University of Tennessee, Knoxville (08/1999 – 12/2001)

- Simulated U.S. EPA CALMET/CALPUFF models to estimate ambient concentrations of NO<sub>x</sub> and SO<sub>2</sub> and deposition of dry/wet nitrate and sulfate and a maximum change of visibility deterioration resulting from potential emission sources in East Tennessee area.
- Developed a modeling protocol for estimating atmospheric concentrations and deposition of acidic species resulting from the emission sources, using both CALPUFF screening technique and CALPUFF refined technique.

**Graduate Research Assistant:** The University of Tennessee, Knoxville (05/1998 – 07/1999)

- Investigated the Volatile Organic Compound (VOC) removal efficiency and adsorption characteristics of various commercially available activated carbon woven and non-woven fabrics at airflow rates, air temperature and pressure drop typical of an indoor air residential or small office environment.

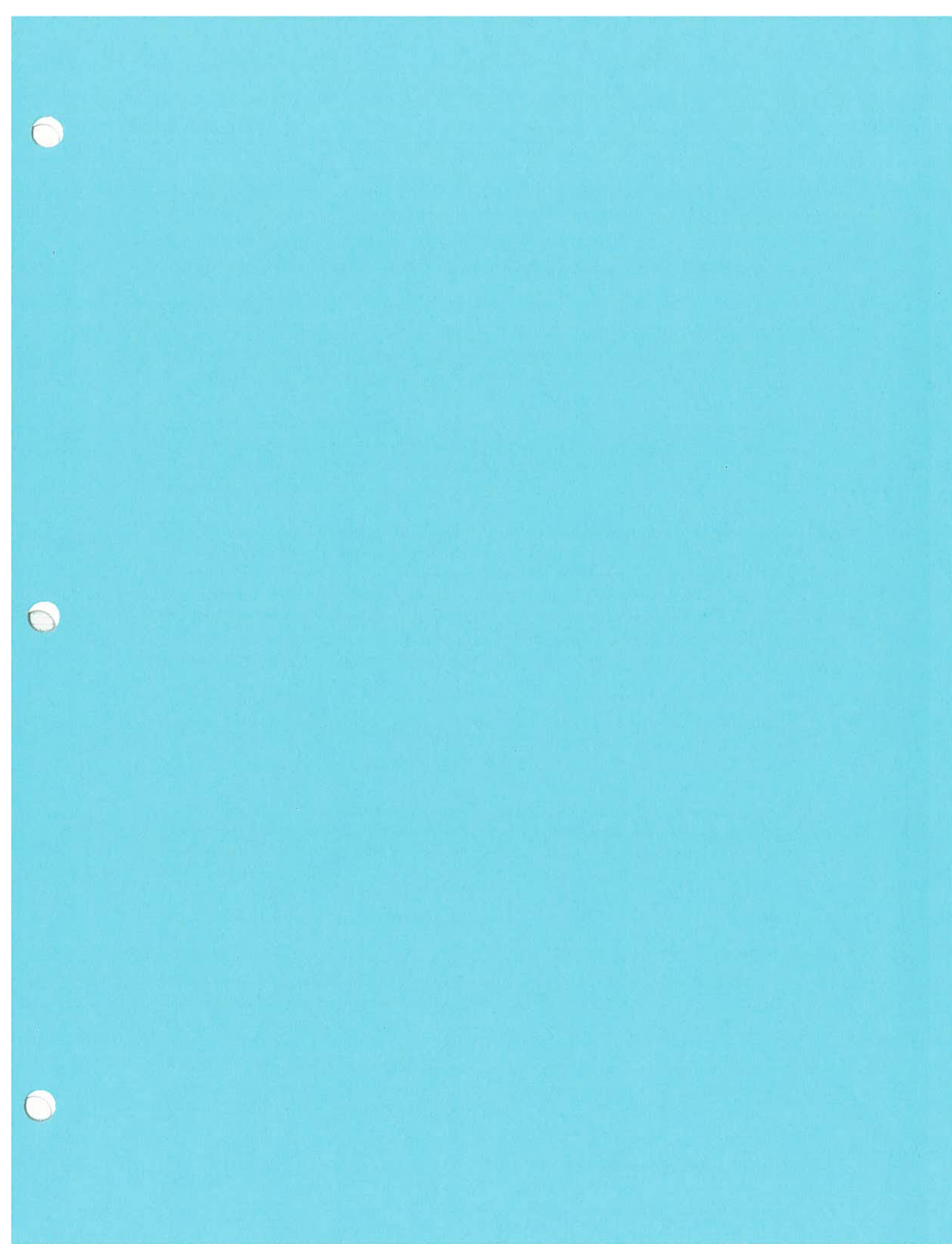
**Graduate Research Assistant:** The University of Tennessee, Knoxville (01/1997 – 05/1998)

- Explored the effect of pre-filters on the performance of High Efficiency Particulate Assurance (HEPA) filters utilized for high efficiency removal of particles from gas streams.

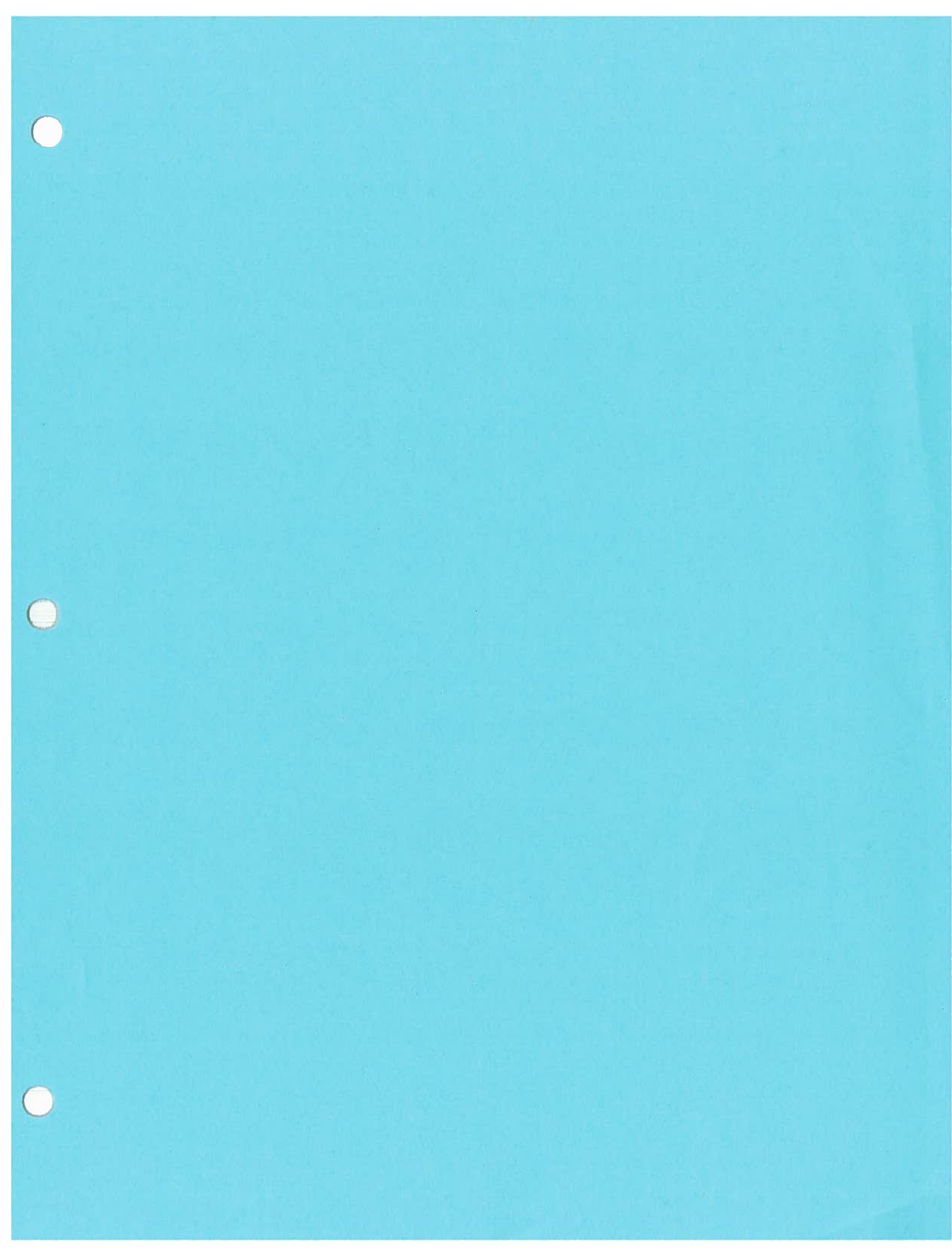
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## COMPUTER SKILLS

- **Operating System:** UNIX, WINDOWS/DOS
- **Air Quality Models:** SCREEN3, CALINE3, ISCST3, AERMOD, CALMET/CALPUFF
- **Programming Languages:** FORTRAN, MATLAB
- **Software:** MS Word, Excel, PowerPoint, Access, SURFER, ARCINFO, ORIGIN, S-plus









**STATE OF NEW MEXICO  
BEFORE THE ENVIRONMENTAL IMPROVEMENT BOARD**

**IN THE MATTER OF PROPOSED REVISIONS  
TO THE STATE IMPLEMENTATION PLAN  
FOR THE SAN JUAN GENERATING STATION  
BEST AVAILABLE RETROFIT TECHNOLOGY  
DETERMINATION**

**No. EIB 13- 02(R)**

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**NMED EXHIBIT 14 – NMED RESPONSES  
TO COMMENTS OF THE  
NATIONAL PARK SERVICE**

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This exhibit presents the Department's responses to comments received from the National Park Service (NPS), dated July 24, 2013, on the proposed Nitrogen Oxide (NOx) best available retrofit technology (BART) determination for the San Juan Generating Station (SJGS). (Document N3615 (2350)) ("NPS comments").

As a threshold matter, the Department notes that the NPS comments appear to be based on an incorrect assumption that the Department is proposing a "better-than-BART" alternative, pursuant to 40 C.F.R. § 51.308(e)(2). The comments further assume that "BART" for the purpose of a "better-than-BART" determination is as defined by the U.S. EPA in the federal implementation plan (FIP) promulgated on August 22, 2011. (*See, e.g.*, comments at p. 1, "The State Alternative needs to demonstrate greater visibility impairment than the EPA FIP proposal.") This is not the case.

The Department proposed SIP revision comprises a revised BART determination pursuant to 40 C.F.R § 51.308(e)(1), based on new information. Specifically, the revised determination considers the voluntary shut-down of two of the four units at San Juan, as envisioned in the "State Alternative" negotiated between NMED, PNM, and EPA. Therefore, while the Department's BART analysis of the "State Alternative" is informed by information contained in the FIP, as well as in NMED's own prior NOx BART determination, the analysis does not purport to rely on the option allowed in § 308(e)(2) of demonstrating "greater reasonable progress" than would the application of BART to all BART eligible sources. In other words, the State Alternative is not "better than BART," it *is* BART.

**Response to Comment Regarding "Step 3: Evaluate Control Effectiveness of Remaining Control Technologies"**

**NMED Ex. 14**

The NPS commented that it believes that it is feasible for the SJGS to achieve a NO<sub>x</sub> emission rate of 0.04 lb/MMBtu on an annual basis, citing the fact that three units with retrofit SCRs operate at or below 0.04 lb/MMBtu, according to the 2012 CAMD database.

The NMED concurred with EPA's determination that a NO<sub>x</sub> emission limit of 0.05 lb/MMBtu was an appropriate emission limit for SCR based on source specific factors and commonly accepted removal efficiencies of a retrofit SCR installation. In order for PNM to meet an enforceable emission limit of 0.05 lb/MMBtu based on a 30-day rolling average, the SCR system would need to be designed to achieve greater removal efficiency for most periods of operation.

This enforceable emission limit also includes consideration of emissions during startup, shutdown, malfunction events that typically result in emissions in excess of those generated during normal operations. *See* 76 Fed. Reg. 52,388, 52,405 ("The CEMS data indicate that our proposed NO<sub>x</sub> BART limit can be achieved without separately limiting startups, shutdowns, and malfunctions.") Air permitting authorities typically take into consideration these types of emissions in addition to normal operating emissions to establish federally enforceable emission limits. This margin ensures that the emission limit is achievable and appropriate for all operating situations.

The NPS comments do not specify what enforceable emission limits apply to the three SCR-retrofit units that NPS cites as operating at or below 0.04 lbs NO<sub>x</sub>/MMBtu, or whether such limits are greater than the actual emission rates cited. As mentioned above, permitting authorities do not establish enforceable emission limits based on actual emission rates, but normally include emissions during startup, shutdown, and malfunction as a small safety factor into the calculated emission limit. In any case, the mere existence of three units with lower actual emission rates, out of hundreds of units employing SCR nationally, does not outweigh the site-specific determination by the EPA that 0.05 lbs/MMBtu is an appropriate SCR-based limit for the SJGS.

#### **Response to Comment Regarding "Step 4: Perform Impacts Analysis of Remaining Control Technologies"**

The NPS presented an estimate of SCR costs based on the EPA's Control Cost Manual and partly based on the EPA's Integrated Planning Model (IPM), concluding that the dollar per ton annual costs of SCR are less than half of what PNM estimated.

The cost estimates provided by the NPS were partly based on a methodology that is more appropriate for regulatory planning purposes and less effective at estimating costs for a source specific SCR installation. This economic model is the Integrated Planning Model (IPM) and is used by EPA to analyze projected impacts from proposed environmental regulations.



Even if the NMED were to accept the NPS cost estimates for SCR installation, this information would not affect the Department's final determination of BART at the SJGS. The NPS estimates indicate the total capital investment for SCR technology would be around \$374,152,055 for a four unit installation. In contrast the total capital investment estimated for the 2 SNCR/2 Unit Shutdown scenario is only \$34,556,000, making this proposal the most cost effective proposal, especially considering the emissions reduction and visibility improvement that would be achieved by this proposed alternative.

#### **Use of actual maximum 24-hour emission rate**

The NPS asserts that PNM should have modeled 24-hour maximum emission rates rather than 30-day rolling average emission rates, because the latter are higher than the former, and should have used actual 24-hour emission rates modified by a percentage reduction to represent control technology.

In fact, PNM did not model the 30 day rolling average, but rather added a 10% safety factor to the 30-day rolling emission limit of 0.30 lb/MMBtu, and therefore assumed a NOx emission rate of 0.33 lb/MMBtu to establish the baseline visibility impact. PNM used this methodology in the original 2007 BART analysis, and all subsequent updated visibility modeling submittals. NMED accepted this methodology because it is actually more conservative (ie, a higher emission rate) than use of the 24 hour maximum emission rates. Specifically, as shown below, use of the 0.33 lb/MMBtu rate results in higher pound-per-hour NOx rates than use of 24-hour maximum rates for three of the four units. For the fourth unit, Unit 4, use of the 0.33 lb/MMBtu rate results in an emission rate that is 29 lb/hr less than the 24 hour maximum rate, an insignificant difference.

<b>Modeled Emission Rates to Establish Baseline Visibility Impacts (lb/hr NOx)</b>				
	Unit 1	Unit 2	Unit 3	Unit 4
CAMD	1203.8	1105.2	1795.5	1893.1
PNM Baseline	1223.3	1217.0	1900.1	1864.2

The Department notes that the use of the maximum 24-hour actual emission rate inherently over-estimates the emission rate for this facility for all other 24-hour periods of the review and does not represent a realistic depiction of actual emissions over the review period. This emission rate represents the highest emission level and we appropriately note that the actual emissions are below this level.

The Department also notes that in other BART evaluations, EPA has accepted the use of average use of engineering estimates of post-control emission rates rather than percentage reductions from maximum 24 hour rates (as suggested by the NPS). Specifically, in its evaluation of Nevada's NOx BART determination for the Reid-Gardner Generating Station, EPA explained:

“Regarding the use of control scenario emission rates based upon annual average emission factors (in lb/MMBtu) instead of 24-hour average emission factors (lb/MMBtu), we disagree with the commenter that these emission rates do not provide acceptable

estimates of visibility benefits. The methodology for calculating control scenario model emission rates described by the commenter involves applying the estimated control efficiencies of particular technology to the baseline (pre-control) model emission rate. While this methodology has been used by EPA, it does not preclude the use of other methodologies for calculating control scenario emissions. In the case of control technology performance, engineering estimates of a particular technology's post-control level of performance will often be expressed in terms of lb/MMBtu, either on a 30-day or annual average basis. To the extent that the engineering estimate represents more accurate depiction of future anticipated emissions at a particular facility, it may be appropriate to rely on the specified post-control level of performance rather than on a control efficiency applied to a pre-control emission rate. In fact, using model emission rates based on an annual average, instead of a 24-hour average, results in more stringent emission rates. 77 Fed. Reg. 50,936, 50,944 (Aug. 23, 2012)

The Department's approach is therefore similar to approaches previously approved by EPA.

The Department does not agree with the NPS assertion that the decrease in SO<sub>2</sub> emissions is only a "paper" reduction in SO<sub>2</sub> emissions. The shutdown of Units 2 and 3 results in a significant decrease in SO<sub>2</sub> emissions from the facility and a real reduction in visibility impacts. In addition, a lower federally enforceable emission limit for remaining Units 1 and 4 will reduce the variability in emissions from these units. The only legal mechanism to ensure that those reductions are realized at these units is by establishing a lower federally enforceable emission limit of 0.10 lb/MMBtu. Without this emission limitation, the facility could have operated at the higher emission rate. Simply because the data reviewed by NPS indicated the facility's actual SO<sub>2</sub> emissions did not approach the upper limit of their SO<sub>2</sub> emission limit does not preclude the facility from being able to do so.

#### **Response to Comments Regarding "Step 5: Visibility Impacts Analysis of Remaining Control Technologies"**

The NPS commented that the Department's reference to EPA's conclusion that ammonia slip would not significantly affect visibility was misleading, because EPA never addressed ammonia slip from SNCR, which can be much higher than from SCR.

The Department agrees that EPA's reference to ammonia slip was with respect to SCR, not SNCR. Nonetheless, for several reasons the Department believes that ammonia slip from SNCR need not be addressed in visibility modeling. There are a couple of reasons that the impact of ammonia slip from SNCR is expected to be negligible in visibility modeling. First, the constant 1-ppb ammonia background concentration used in the PNM BART visibility modeling is representative of actual ammonia concentrations directly around the San Juan Generating Station (SJGS) emission sources, according to the EPA. See 76 Fed. Reg. 52,388, 52,434 (Aug. 22, 2011). Second, the ammonia removal efficiency from the wet scrubber for SNCR is 90%, the same value that was used in EPA Region 9's BART determination for Navajo Generating Station. See Docket Number: EPA-R09-OAR-2013-0009 – Technical Support Document for Proposed Rule, at p. 122. EPA was also concerned with the impact of the remaining ammonia after the 90% control for the Navajo project, and performed modeling analysis to take into

account the impact of the net ammonia slip. EPA determined that the net ammonia slip effect would be negligible. The PNM modeling used the same ammonia background value and the same wet-scrubber removal efficiency as the EPA modeling for the Navajo Generating Station. As with that analysis, the projected increase in ammonia concentrations due to ammonia slip is expected to be a small fraction of ammonia background levels. Therefore, the impact of the ammonia slip from SNCR should be negligible.

### **Response to Comments on “2013 BART Determination”**

The NPS commented that it was not clear on the bases for this statement in the BART determination:

“The retirement of Units 2 and 3 will reduce the facility annual NO<sub>x</sub> emissions by an additional 10,550 tons. When added to the controlled emission rate of Units 1 and 4, total annual NO<sub>x</sub> emission will be reduced by 12,989 tons.”

The bases for this statement can be found in Table 10 on p. 18 of Appendix D. Current (i.e., “Consent Decree”) NO<sub>x</sub> emissions are 4119 tons per year (tpy) for Unit 2 and 6431 tpy for Unit 3. The sum of these is 10,550 tpy, which is therefore the reduction that would be achieved by shutting down these units.

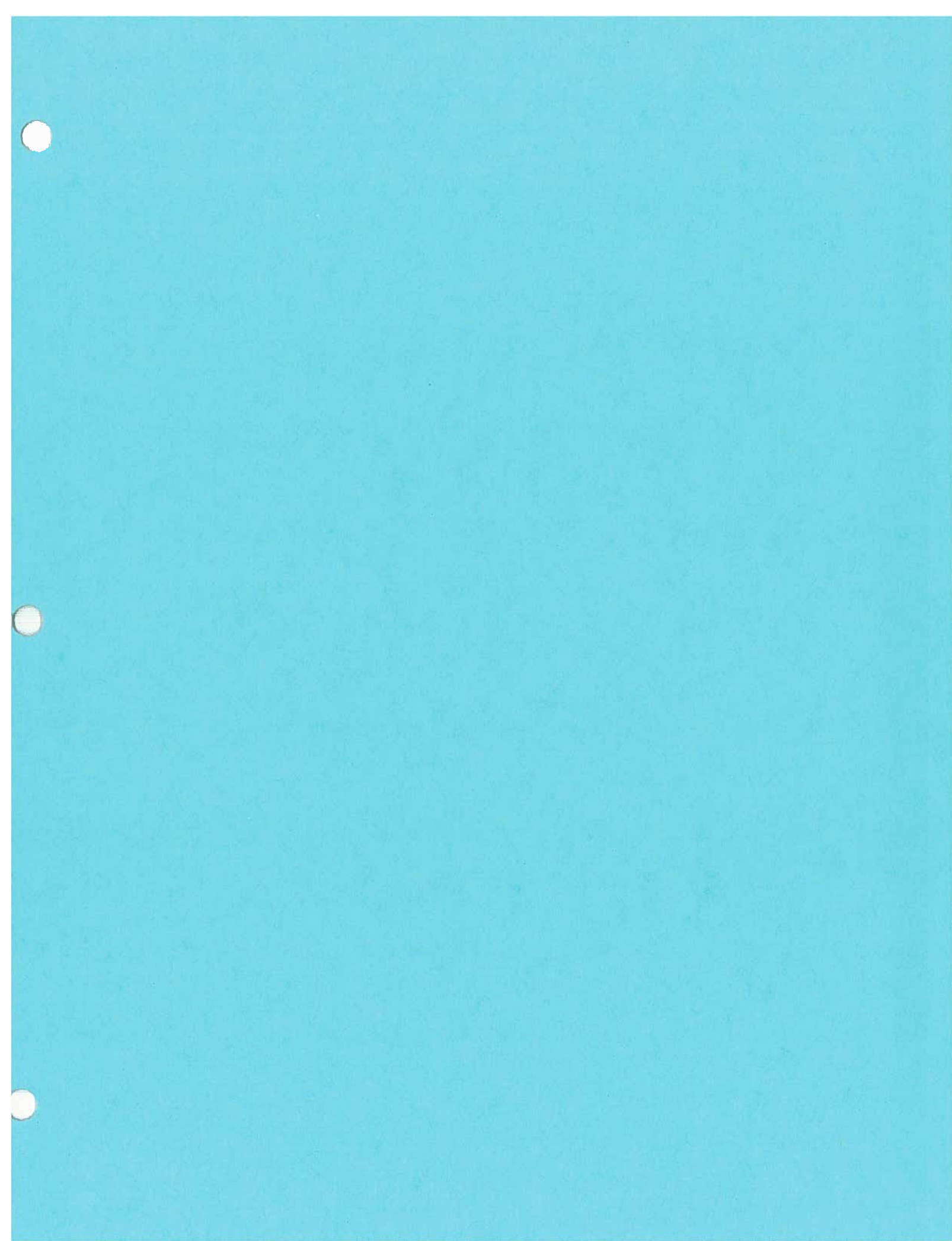
The reductions from controlling Units 1 and 4 with SNCR are, respectively, 966 tpy (4,140 tpy under consent decree minus 3,174 tpy under SNCR) and 1,472 tpy (6,309 tpy under consent decree minus 4,837 tpy under SNCR).

Total annual NO<sub>x</sub> reductions are therefore  $10,550 + 966 + 1,472 = 12,988$  tons.

The NPS pointed to a condition requiring optimization of NO<sub>x</sub> reduction contained in a prior consent decree between the Department, PNM, and the Grand Canyon Trust, and requested that the Department describe how that condition has been implemented. See comments at p. 6, footnote 8 (setting forth language that is contained in Consent Decree CV 02-552 BB/ACT (ACE), Paragraph V.9 (b)).

In 2009 and 2010, PNM submitted the required performance reports for each unit, covering the first 12 months of operation after installation of NO<sub>x</sub> controls at that unit. Based on the results of the tests and the provision in the referenced paragraph calling for the addition of a 10% margin of safety, PNM recommended that the NO<sub>x</sub> emission limit remain at 0.30 lb/MMBtu. The Department, however, disapproved PNM’s test reports as containing insufficient information to allow the Department to determine whether an emission rate of less than 0.30 lb/MMBtu was feasible. This disapproval triggered a dispute resolution procedure under the consent decree. In May of 2011, the parties (including Grand Canyon Trust) agreed to terminate the dispute resolution process if either the Environmental Improvement Board (EIB) or the EPA adopted a NO<sub>x</sub> limit for SJGS of 0.28 lb/MMBtu or lower, unless PNM challenged such limits. In June 2011, the EIB adopted the Department’s proposed NO<sub>x</sub> BART limit of 0.23 lbs/MMBtu, based on installation of SNCR, and PNM did not challenge this standard. In

accordance with the parties' agreement, no further efforts were made to determine whether the consent-decree technology could achieve a NO<sub>x</sub> rate lower than 0.30 lbs/MMBtu.





NMED EXHIBIT 15

PROPOSED ORDER AND STATEMENT OF REASONS

FOR ADOPTION OF SIP REVISIONS





**STATE OF NEW MEXICO  
BEFORE THE ENVIRONMENTAL IMPROVEMENT BOARD**

**IN THE MATTER OF PROPOSED REVISIONS  
TO THE STATE IMPLEMENTATION PLAN  
FOR THE SAN JUAN GENERATING STATION  
BEST AVAILABLE RETROFIT TECHNOLOGY  
DETERMINATION**

**No. EIB 13- 02(R)**

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**ORDER AND STATEMENT OF REASONS  
FOR ADOPTION OF SIP REVISIONS**

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This matter comes before the New Mexico Environmental Improvement Board (“Board”) upon a petition filed by the New Mexico Environment Department (“NMED” or “Department”), proposing amendments to New Mexico’s State Implementation Plan (“SIP”) for regional haze, in order to adopt a determination of the Best Available Retrofit Technology (“BART”) and associated emission limits for the San Juan Generating Station (“SJGS”), operated by Public Service Company of New Mexico (“PNM”). A public hearing was held in Farmington, New Mexico on September 5 [and 6], 2013, with a quorum of the Board present during the hearing. The Board heard technical testimony from the Department and other parties and admitted exhibits into the record. On September \_\_, 2013, the Board deliberated and voted to adopt the proposed amendments for the reasons that follow:

**I. STATEMENT OF REASONS**

1. The federal Clean Air Act (“CAA”) requires states to submit State Implementation Plans (“SIPs”) to address visibility impairment caused by regional haze at certain National Parks and Wilderness Areas (“mandatory federal Class I areas”), in accordance with

regulations promulgated by the U.S. Environmental Protection Agency (“EPA”). CAA §§ 169A & 169B (42 U.S.C. §§ 7491 & 7492 ).

2. The EPA regulations governing SIP submittals under CAA Sections 169A and 169B are codified at 40 C.F.R. §§ 51.308 – 51.309 (“Regional Haze Rule Sections 308 and 309”).
3. In December 2003 the Board approved a SIP developed by NMED to comply with the Requirements of Regional Haze Rule Section 309 with respect to mandatory federal Class I areas located on the Colorado Plateau. The Department has implemented this “Section 309 SIP” continuously since that time.
4. In June 2011 the Board approved certain revisions to the 2003 regional haze SIP and adopted additional SIP provisions pursuant to 40 C.F.R. § 51.309(g), which extended the scope of the regional haze SIP to all mandatory federal Class I areas within the State.
5. The 2011 SIP contained source-specific BART determinations pursuant to 40 C.F.R. § 51.308(e) for the SJGS for particulate matter (“PM”) and nitrogen oxides (“NOx”), and determined that no other sources in New Mexico were subject to BART requirements. The BART provisions of the SIP were contained in Chapter 10 and the documentation of the SJGS BART determination was contained in Appendix D of the SIP.
6. In August, 2011, the EPA promulgated a federal implementation plan (“FIP”) containing a different NOx BART determination for the SJGS. 76 Fed. Reg. 52,388 (Aug. 22, 2011).
7. Petitions filed by New Mexico, PNM, and WildEarth Guardians challenging different aspects of the FIP are currently pending in the United States Court of Appeals for the Tenth Circuit.

8. In November, 2012, the EPA approved all elements of New Mexico's 2011 regional haze SIP, except for the NO<sub>x</sub> BART determination for the SJGS, on which EPA took no action. 77 Fed. Reg. 70,693 (Nov. 27, 2012).
9. Pursuant to 20.1.300.A NMAC, any person may petition the Board for amendment of regulations within the jurisdiction of the Board.
10. On May 21, 2013 NMED filed a petition with the Board for a public hearing in this matter. The petition proposed revised versions Chapter 10 and Appendix D of the regional haze SIP. The purpose of the revisions is to make a new BART determination for the SJGS based on a scenario referred to as the "State Alternative," which is contained in a tentative agreement between NMED, EPA, and PNM known as the "Term Sheet." The Term Sheet is intended to address pollution control requirements for the SJGS with respect to regional haze and interstate transport for visibility.
11. On June 15, 2013, at a meeting conducted in compliance with the Open Meetings Act and other applicable requirements, the Board granted the Department's request for a hearing and scheduled the hearing for September 5 – 6, 2013. The Board appointed member John Volkerding as the Hearing Officer.
12. On June 28, 2013, public notice of the hearing was published in the New Mexico Register, in the Farmington Daily Times (in English and Spanish), and in the Albuquerque Journal (in English and Spanish). The notice stated that the Board may make a decision on the proposed SIP revisions at the conclusion of the hearing, or may convene at a later date to consider action on the proposal.
13. NMED filed a Notice of Intent to Present Technical Testimony (NOI) on August 16, 2013, in accordance with the 20.1.1 NMAC.

14. The following parties also filed NOIs:
15. A hearing was in this matter was held in Farmington, New Mexico on September 5 [& 6], 2013, at which a reasonable opportunity for all persons to be heard was provided.
16. The Board has the authority to adopt the proposed SIP revisions pursuant to N.M.S.A. 1978, §§ 74-2-5.B & C.
17. Implementation of the State Alternative will abate air pollution.
18. CAA § 169A(g)(2) requires that BART determinations shall take into consideration “[1] the costs of compliance, [2] the energy and nonair quality environmental impacts of compliance, [3] any existing pollution control technology in use at the source, [4] the remaining useful life of the source, and [5] the degree of improvement which may reasonably be anticipated to result from the use of such technology.”
19. In considering the proposed SIP revisions, the Board is required by the Air Quality Control Act, NMSA 1978, Section 74-2-5.E. to give weight it deems appropriate to all facts and circumstances, including but not limited to (1) character and degree of injury to or interference with health, welfare, visibility and property; (2) the public interest, including the social and economic value of the sources and subjects of air contaminants; and (3) technical practicability and economic reasonableness of reducing or eliminating air contaminants from the sources involved and previous experience with equipment and methods available to control the air contaminants involved.
20. EPA has promulgated guidelines for States to use in making BART determinations, which are codified at 40 C.F.R. Part 51, Appendix Y. Pursuant to CAA § 169A(b)(2),

use of the guidelines is mandatory for BART determinations for fossil fuel fired power plants with total generating capacity in excess of 750 megawatts.

21. NMED's determination that the State Alternative constitutes BART for NO<sub>x</sub> for the SJGS complies with the guidelines at 40 CFR Part 51 Appendix Y and properly weighs the statutory factors of CAA § 169A(g)(2).
22. The Board concludes that the BART guidelines at Appendix Y provide an appropriate methodology to consider to the factors specified by NMSA 1978, Section 74-2-5.E. The Department's application of Appendix Y to the BART determination for the State Alternative appropriately weighs the Section 74-2-5.E factors.
23. In addition, in accordance with N.M.S.A, Section 74-2-5.E (2), the Board concludes that the public interest will be served by implementation of the State Alternative. Specifically, in addition to satisfying the NO<sub>x</sub> BART requirements of the CAA, implementation of the State Alternative will result in significant reductions in sulfur dioxide, particulate matter, carbon dioxide, and mercury; significant reductions in coal ash generated and water consumed.
24. In accordance with NMSA 1978 Section 74-2-5(C)(1)(a), the proposed SIP revisions and regulations are no more stringent than but at least as stringent as required by the federal act and federal regulations pertaining to visibility protection in mandatory class I areas.
25. The notice and hearing requirements of NMSA 1978 Section 74-2-6 and 20.1.1 NMAC were satisfied in this rulemaking process.
26. The proposed amendments are adopted for any or all of the reasons stated above.

## II. ORDER

By majority vote of a quorum of the Board members, the proposed revisions to New Mexico's regional haze SIP at Chapter 10 and Appendix D, as contained in NMED's May 21, 2013 petition and request for hearing, were approved by the Board on September \_\_\_, 2013. The Department shall submit these SIP revisions as expeditiously as possible to the EPA for approval. To the extent that any provision within Chapter 10, Section 10.5 (Implementation of the State Alternative) is not self-executing, the Department shall take appropriate actions to implement that provision using its applicable powers and authorities, including but not limited to enforcement authority under N.M.S.A. 1978, 74-2-12 and permitting authority under N.M.S.A. 1978, § 74-2-7, and implementing regulations.

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Dated: \_\_\_\_\_

On Behalf of the Board